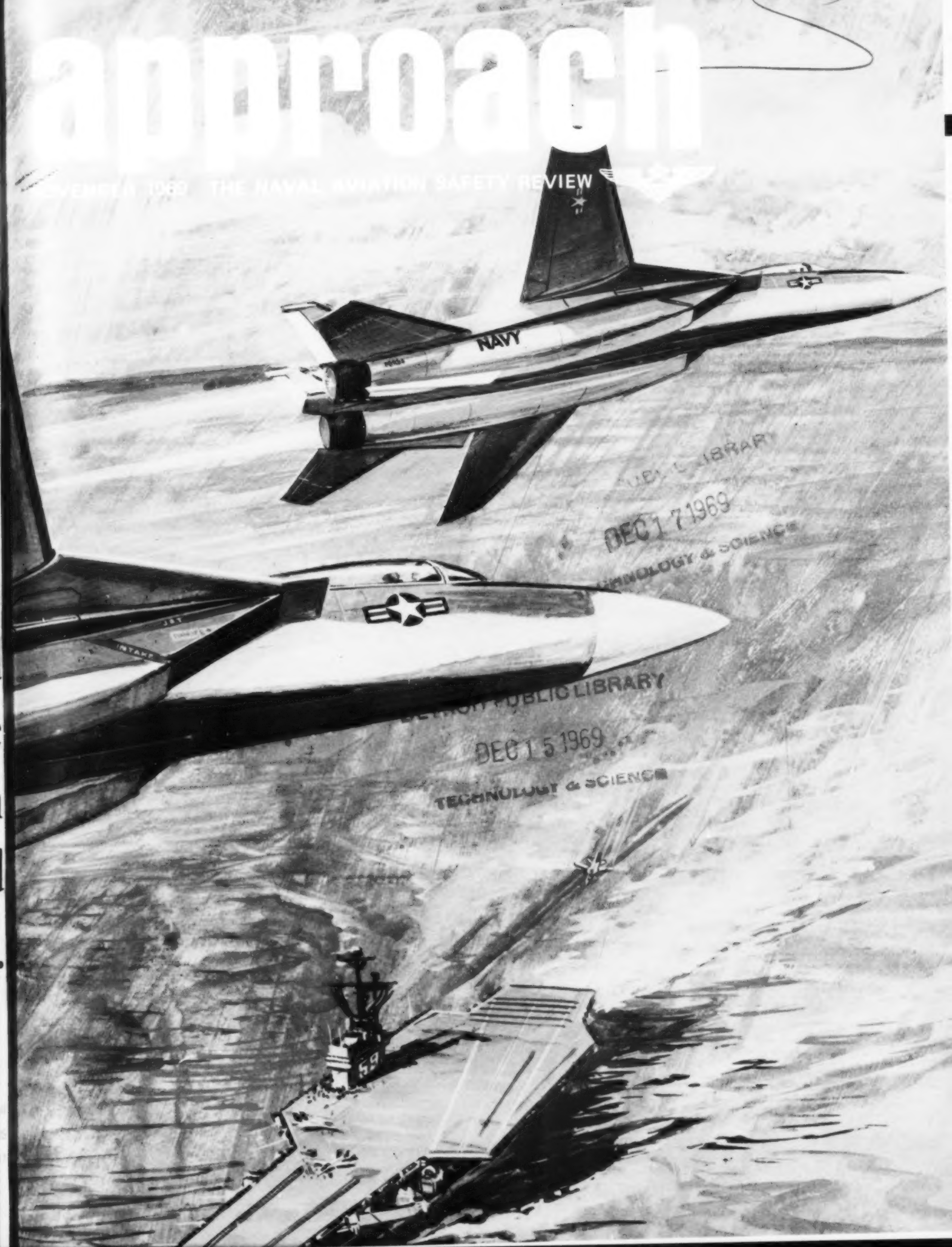
approach

NOVEMBER 1969 THE NAVAL AVIATION SAFETY REVIEW



Plan to be ready

when

A moment white, then melts forever.
Robert Burns

nwinter comes

EACH winter brings certain particular problems to naval aviation operations that increase the difficulty of many routine tasks. Fortunately, these problems can be largely overcome with thorough *advance planning*.

Every naval aviator knows that each flight he participates in requires certain preparations to insure its successful completion. The advent of winter simply adds to those preparations by creating unique conditions not encountered during the warmer seasons.

Planning Flight Operations

One of the first requirements for successful winter flight operations is that you know your aircraft as thoroughly as possible. Review the operation of all aircraft systems which might be adversely affected by cold weather – well in advance of intended flights. This should include the electrical system; flight control system; pitot-static systems; propeller pitch control and deicing systems; fuel system; aircraft heating or air conditioning system; windshield rain-removal and anti-icing system; wing and empennage deicing; oil dilution; engine anti-icing system; and landing gear, flap and slat operation. Dig deep into the NATOPS Manual (and the Maintenance Instruction Manual, if necessary) in order to have a complete understanding of these systems.

Continued

Cross-Country Flight

Start your cross-country flight planning well in advance by requesting an extended weather forecast from aerology several days before your departure. Be aware that wind patterns shift with the seasons. The jet stream, in particular, will shift to the south during winter months and will drop down to lower altitudes. If your flight is headed west or southwest, expect a greater headwind component. This means shorter flights between fuel stops.

Spend some time studying the destination and enroute airfields in detail. Approaches may be made in conditions of poor visibility. Snow on the ground may blot out or distort the appearance of many landmarks. While you are looking over the airfield layout, pay particular attention to the location and type of emergency field arresting gear; also carefully note any obstructions which may present a hazard to flight or ground operations.

Before filing your flight plan with ops, give it a last minute but very careful review – this time with the benefit of up-to-the-hour weather information from aerology.

Give the NOTAM file a careful check. It may be that one or more runways at your destination have been closed because of snow and ice since many airfields attempt to keep only the main instrument runway open during heavy snowfalls. Keep in mind also that valuable as NOTAMS are, they will not always provide advance warning of field closings. During severe storms, major airports will shovel snow and keep operating as long as they can – until the sheer mass of precipitation overcomes them. Then, there is no alternative but to close the field. This is an excellent reason for being conservative in planning the length of your flight so you will have an adequate fuel reserve to proceed to a suitable alternate if it should be required.

If the existing wind and weather at your takeoff point is marginal, reconsider whether the flight should be made at all. If you happen to have an aircraft with critical cross-wind characteristics it may be that takeoff is not warranted. The better part of valor may be to stay home and wait for conditions to improve.

Conduct a thorough preflight before takeoff to insure that your aircraft is ready in all respects. Insure that all surfaces of the aircraft are free of frost, ice and snow. Any of these deposits can change the aerodynamic shape and/or characteristics of the airfoils, raising the stall speed and increasing the takeoff roll. The best and safest course is to insure complete removal of all deposits prior to takeoff.

Insure that pitot tubes, static ports and fuel tank vents are free of ice and snow. Before starting engines, insure that they are not frozen or hydraulically locked. Consider preheating engines before start, particularly in the case of propeller aircraft. Generally, if the outside air temperature is 20^{0}F or lower, prop engines and oil systems should definitely be preheated.

Beautiful! But only if you don't have to walk home.

'Nuff said!

Start prop engines (as well as jets) with external power whenever possible. This will protect and conserve batteries which may already have been weakened by the cold. After start, check for proper generator and battery outputs.

Use Care During Taxi

Due to obliteration of markings on the ground, other aircraft may not be parked correctly and you could hit one of these aircraft even though you remain on the prescribed taxiway, so keep a good lookout. While taxiing, taxi slowly and lead into turns. Brakes may be almost totally ineffective on icy surfaces. If yours is a multi-engine aircraft, use differential power for turning – but carefully.

Takeoff

Directional control can be a problem during takeoff, especially in a crosswind. Nosewheel steering may have less than the desired amount of effect. Braking for control until rudders become effective can be particularly hazardous. A wheel that is locked and skidding on ice and then suddenly crosses a dry spot of runway can cause a blown tire or, worse, a violent swerve. If there is snow, slush or water on the runway, expect a longer takeoff roll.

Power available for takeoff will be greater in cold temperatures because of the more dense air, so use care not to overboost prop engines.

After takeoff, if conditions permit, make a slight delay in retracting the gear. This will allow the wind to blow excess water and slush off the landing gear. Likewise, cycling the gear after retraction will minimize the possibility of landing gear or landing gear doors freezing in the retracted position.

Climb and Cruise

If you must climb through altitudes where icing conditions exist, do so as rapidly as possible to minimize ice accumulation. Plan your cruising altitude to stay clear of icing but if you do encounter icing attempt to get approval for a change of altitude as soon as possible, regardless of type aircraft. This action is mandatory in aircraft which do not have wing and empennage ice removal systems; it is also highly desirable in any type aircraft because it is simply poor headwork to cruise in known icing conditions if it can be avoided.

Turbojet Engine Icing

Turbojet engine icing can become a problem. Centrifugal flow engines such as the J33 and J48 are relatively safe for flight in limited icing conditions but axial flow turbojet engines can be seriously affected by

the same atmospheric conditions which cause wing icing. Ice can form over inlet guide vanes causing a restriction in air flow, resulting in reduced thrust, increased tail pipe temperatures, excessive turbine temperatures and possible turbine failure. For a given engine, the rate of ice accumulation is approximately in proportion to the intensity of the icing condition and the *air flow through the engine; the air flow being generally in proportion to the engine RPM*. The *rate* of engine icing, therefore, may be reduced by lowering *engine RPM*.

Lengthy studies pertaining to the icing characteristics of clouds show that in stratus (layer type) cloud formations, the actual icing region is seldom more than 3000 feet in depth with 1000 feet the more usual occurrence. However, the icing region can extend for many miles horizontally. For cumulus type cloud formations, the depth of icing is considerably greater but the horizontal dimension of the icing area is seldom greater than three miles; therefore, whenever operational conditions permit, the general rule should be to change altitude (climb or descend) when encountering layer cloud icing and vary course as appropriate in order to avoid cumulus cloud icing.

Carburetor Icing

Conditions which are conducive to carburetor icing should be recognized (generally this is in the carburetor air temperature range from -5°C to +10°C). Carburetor preheat (alternate air) should be applied *before* icing occurs. If this is done, most systems are adequate to maintain carburetors free of ice. On the other hand, they usually are inadequate in removing heavy ice from carburetors once it has formed. Generally, alternate air should be regulated as necessary to maintain a carburetor air temperature between +10 and +38°C. Use care not to exceed +38°C since this could cause premature detonation at high power settings.

The Approach

As you approach your destination, don't be too eager to ask for or accept an enroute descent unless you are sure that it will not result in excessive fuel consumption or prolonged flight in icing conditions. Recognize that a low approach in icing conditions in tactical jet aircraft constitutes an *emergency approach* and should not be attempted if other alternate courses of action are available. Before commencing descent, have your aircraft set up. Insure that defrosters are turned on in time to prevent canopy frosting during the

Caution: Snowbanks along runways and taxiways may thaw and refreeze, assuming the consistency of granite.

penetration/approach. Monitor engine instruments carefully during descent. If the aircraft has accumulated structural ice, make allowances and maintain adequate flying speed. Turn off the deicer boots before the final portion of the approach since they deform the leading edges of the wing and cause an increase in stall speed.

Keep approach control informed of any problems during the approach – minimum fuel, lost navaids, etc. Be prepared to locate the runway when you break out, bearing in mind that snow may mask or distort its appearance. Instead of that 150 to 300 foot wide runway you are looking for, you may see what appears to be little more than a horse and buggy trail across a white field. If the situation dictates, don't hesitate to ask for strobe lights, approach lights or runway lights.

The Landing and Rollout

Plan your touchdown point and landing speed carefully. Don't forget that excess speed on final will add to your problem of getting stopped. After touchdown, there are three *normal* methods of stopping the aircraft: aerodynamic drag, wheel braking and reverse thrust (available on some aircraft).

One of the most likely problems to be encountered in getting stopped during winter conditions is hydroplaning. To briefly review the subject of hydroplaning, there are two types: dynamic and viscous. *Dynamic* hydroplaning (where the water lifts the tire completely off the runway surface) occurs when the runway is flooded to a critical depth (about .2 inch) and the aircraft is traveling at a speed in excess of a critical ground speed (about nine times the square root of the tire inflation pressure). This results in an almost complete loss of contact between the wheel and runway surface and virtually complete loss of braking effectiveness. *Viscous* hydroplaning, on the other hand, occurs at a much lower ground speed than dynamic hydroplaning and requires only a thin film of fluid to be present on a smooth surface. Fortunately, the existing texture of most runway surfaces is sufficiently rough to break up any thin viscous film which can lead to this type of hydroplaning.

The effects of dynamic hydroplaning (the most commonly encountered of the two types) can be partially overcome by making maximum use of aerodynamic drag for braking. These drag effects are greatest during the first part of the landing roll (when the effects of dynamic hydroplaning are worst) since drag varies directly as the square of the aircraft velocity. Therefore, maximum use should be made of aerodynamic braking as soon as possible after touchdown. This can be accomplished by placing the aircraft in a high drag configuration. The aircraft should be rotated to the highest permissible angle-of-attack,

No place to be in a summer flight suit!

maximizing the induced drag. In addition, all available drag devices (drag chutes, speed brakes, spoilers and flaps) should be used unless prohibited by NATOPS.

Wheel braking should not be commenced until the maximum benefit has been obtained from aerodynamic drag. When wheel braking is attempted, its effect will depend upon the coefficient of friction available between the runway surface and the tires, and the proportion of the aircraft's weight on the braking wheels. A dry, clean concrete runway surface will provide the best coefficient of friction but water, ice, etc., will reduce braking efficiency dramatically, perhaps by 75 percent – or more.

When you have brought the aircraft under control and have turned off the runway, use extreme care in taxiing so as to remain on the taxiway and clear of obstructions. This is where your knowledge of airfield layout (obtained by prior study) will be especially valuable.

Postflight Checks

Perform all required postflight checks and after shutdown, see that the aircraft is properly secured; that intake, exhaust, pitot tube, engine and canopy covers are installed for maximum protection against the elements.

Give Winter Some Thought

Winter operations deserve a lot of attention. We have suggested some areas which, if not prepared for, could present real problems to someone, somewhere. We recognize that our coverage has been rather superficial so we urge individual pilots to give winter weather problems further study on their own.

Remember, with adequate preparation many of the problems associated with winter weather can be minimized or eliminated entirely. The emphasis is on *planning*.

Continued

Cold Weather References

Aviation Clothing and Survival Equipment Bulletins

Interim Aircrew Systems Bulletin No. 139 – Mk-5A anti-exposure coverall exhaust valve diaphragm; inspection of

Aircrew Systems Bulletin No. 149 – Coverall, flying, anti-exposure, quick-donning; description, use, inspection and care of

Clothing and Survival Equipment Bulletin No. 10 – Coverall, flying, anti-exposure; Mk-5A

Clothing and Survival Equipment Change No. 7 – Mk-5A anti-exposure suit; modification of

Clothing and Survival Equipment Change No. 8 – Mk-5 liner, retrofitting for use with Mk-5A anti-exposure coverall

Clothing and Survival Equipment Change No. 28 – Survival knife packet and signal kit (flare gun) packet; fabrication and installation of

Clothing and Survival Equipment Change No. 160 – Summer flying coveralls, Mk-5A anti-exposure coveralls and MA-2 integrated parachute harness for use with LPA-1 life preserver; modification of

Clothing and Survival Equipment Bulletin No. 60-61 – Coverall, flying, anti-exposure, Mk-5

Clothing and Survival Equipment Bulletin No. 41-62 – Suit, flying, anti-exposure Mk-4; instructions for fitting, use and care of

Miscellaneous

BuWeps NA00-80T-32	Polar Guide
BuWeps NA00-80T-52	Safety and Survival Equipment for Naval Aviation
BuWeps NW00-80Q-31	Carrier Cold Weather Starting Sense
BuWeps NA00-80T-56	Survival Training Guide
BuWeps Tech Note 5-55	Turbojet Engine Icing
FAA-AC-91-12	Cold Weather Operations of Aircraft

Navy Training Films

MN7474A – Ground Handling of Aircraft in Cold Weather – General Maintenance Procedures

MN7474B – Ground Handling of Aircraft in Cold Weather – Taxiing, Towing and Securing

MN7474C – Ground Handling of Aircraft in Cold Weather – Preparing Aircraft for Flight

MN9372 – Anti-icing and Deicing Systems for Airplane Surfaces

MN9487A – Ice Formation on Aircraft

MH7491 – Cold Weather Training – Indoctrination and Survival

MN9549 – Mk-5 Anti-Exposure Suit

Approach Articles

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Jul 67, page 20	Frozen Slats (Anymouse)
Jun 67, page 10	Wet Asphalt Runways
Feb 67, IBC	Be Careful of that Ice on the Taxiway
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Nov 65, page 24	Cold Facts

Doing Something About the Weather

THE OLD SAYING that "everyone talks about the weather but no one does anything about it," is not completely true. The U.S. Fleet Weather Facility, Keflavik, Iceland, has prepared a pamphlet which should better prepare pilots to do something about the weather when operating in that area. The pamphlet, entitled, "The Fighter Pilot's Guide to Icelandic Weather," is designed as an indoctrination hand-out to be provided to USAF pilots reporting to the Iceland based 57th Fighter Interceptor Squadron.

This pamphlet covers the weather conditions which usually prevail in the Iceland area and includes short chapters on:

- Ice and frost on runways.
- Turbulence and CAT.
- Blowing snow.
- Fog.
- Aurora Borealis.
- Hours of daylight and darkness.
- Crosswinds.
- Weathervision briefings.

As the Commanding Officer of the Fleet Weather Facility notes in the introduction of the guide, some of the most adverse weather known to the airman lies over Iceland and its contiguous waters. Passing storms return to haunt the aviator. Moreover, a scarcity of weather observation stations in the area dictates relentless vigilance on the part of both the pilot and meteorologist.

The Commander of the Iceland Defense Force suggests that this guide would be useful to carrier aviators operating in Northern waters and, perhaps more importantly, he suggests that the idea of preparing guides to unique weather problems which exist in other well-defined operational areas might also be pursued.

To expand on the idea, the suggestion is offered that air stations, particularly those with unique weather problems, could prepare guides similar to the one described here and make them available to aircrews who fly in those areas. A subsequent exchange of booklets between air stations and operational areas would provide transient or TAD pilots with *advance* information on unfamiliar fields or operational areas.

NavSafeCen thinks it is an excellent idea. What do you think? Let us have your opinions on the practical value of such guides. Address your letters to the Editor, APPROACH, Naval Safety Center, Naval Air Station, Norfolk, Va., 23511, Attn: Safety Education Department. We'll be happy to pass consolidated views on to appropriate authorities.

Short Snorts

The greatest cause of accidents is being physically present and mentally absent.
Charles Kettering

Jammed Controls

AN A-4 took off as No. 2 on what was to have been a low-level training flight. Right after takeoff, the aircraft rolled into a 20-degree angle of bank to the left. The pilot's efforts to counteract the left bank with right aileron were to no avail; the stick could not be moved to the right. There was a definite obstruction. The aircraft continued to roll left but the pilot was able to stop the roll with full right rudder. The aircraft was then gradually returned to a wings level attitude by the continued use of full right rudder.

Full right rudder trim helped relieve the pressure on the pilot's right leg and the climb was continued. At about 600 feet of altitude a gust caught the aircraft and caused it to roll left again. As it rolled the nose fell and the aircraft began to lose altitude. The wings were again leveled with rudder and the altitude loss was arrested at 200 feet to 300 feet.

The pilot commenced a wide downwind at about 400 feet, dumping fuel. The landing gear was lowered (flaps were still down) and the pilot requested a morest landing. The tower cleared the pilot as requested and advised that the gear was set for 16,000 pounds and 160 knots. The pilot started a gentle turn to final, intercepting the runway centerline at about one-half mile. Because of the low altitude, the pilot decided against pulling the manual disconnect.

Once lined up on final the pilot experienced difficulty staying lined up. Passing the runway threshold, the aircraft was still 200 feet high and considerably left of the runway. Believing it imperative to land on that pass the pilot applied full right rudder and the aircraft started a slow descending skid to the right. The runway was contacted approximately 1500 feet to 2000 feet short of the morest on the extreme left side of the runway. With plenty of speed the pilot guided the aircraft to the runway centerline using rudder. The fuel dump was secured on the roll and the morest was engaged at 150-160 knots. The arrestment was completed without further problems.

Investigation revealed a piece of pipe, 8 inches long by 1 inch in diameter, lodged in the quick-disconnect assembly, preventing movement of the stick to the right and allowing only a small amount of movement to the left.

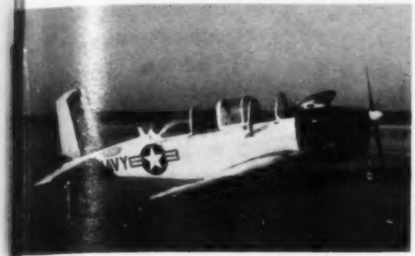
Where did this piece of pipe come from? It was cut from an old A-4 ladder for use as an extension for leverage on a wrench. It had been used one week before during the installation of a fuel control.

This is one more *proof* that it pays well to maintain strict accountability of all tools and points out the disastrous potential if this is not done. It is also one more *proof* that it pays the pilot to perform all pretakeoff checks, including the *controls free* check.

Jammed Landing Gear

AN INSTRUCTOR and his student completed their high work in a T-34B and then commenced some touch-and-go landings. Upon lowering the landing gear the starboard MLG would not indicate DOWN and LOCKED. Cycling the gear did not remedy the situation nor did hand cranking the emergency system. A few sharp high G pullouts also failed.

Visual inspections by other airborne pilots indicated that all appeared to be DOWN and LOCKED so the instructor made a



The starboard MLG collapsed but the nose gear saved the prop.

careful landing. Everything seemed to hold until the aircraft was slowed to 10 knots, then the starboard MLG collapsed inward (normal retraction action). The nose wheel and port MLG held so the propeller and the engine were not damaged. The starboard wing, however, received considerable damage to the tip area.

The landing gear failed because the acutator rod was bent slightly thus preventing the down lock from going home. The accident points out the necessity for more detailed preflight inspections of landing gear mechanisms for bent actuator rods and loose bolts.

Saved By A Wire?

WHILE flying an authorized low level navigation training flight the pilot of an F-8E became concerned about his exact location. While concentrating on his maps and instruments he apparently neglected to keep a good visual lookout. Visibility was only about five miles because of a desert dust haze at 200 feet AGL where he was flying. He was assisted in his reorientation by the sudden appearance of some high tension electrical cables which he did not observe in time to miss. Fortunately, he was able to remain airborne and inspection by his wingman indicated a safe flight to home base could be made.

The port outboard wing leading edge droop sustained a gash and there was damage to the port forward outer wing panel tip, the lower, forward, fuselage skin and the intake duct. The nose gear door was damaged and as a result inside equipment was dislocated so as to prevent full nose gear extension. Consequently, on landing rollout the nose gear collapsed further damaging the nose section.

Compounding the problem of cockpit preoccupation, the pilot was flying lower than briefed. Pilots on sandblower missions must realize these extra dangers. In wartime enemies have been known to erect many types of hazards to low flights. Training and safety will benefit if pilots will always assume the hidden presence of obstacles as if erected by an enemy.

Unwarranted Assumption

THE PILOT of a US-2C set the parking brake shortly after leaving the chocks in order to add sufficient RPM to receive taxi clearance from the tower. He then continued taxiing and applied steady pressure on the port brake to make a left turn onto the taxiway. Without being pumped, the brake would not turn the aircraft and it continued straight ahead and impacted with a parked F-8D. Minor damage to the *Stoof* and limited damage to the F-8 resulted.

The pilot at the controls was not qualified in S-2 aircraft and he didn't realize that the parking and emergency brakes in the S-2 were one and the same. This caused the delay in application of the emergency brake at a critical time. The plane commander in the right seat was considered to be well qualified in type but he was inattentive to external conditions and unaware of the degree of qualification of the copilot. He attempted corrective action, too late to be effective, by shouting to the pilot to apply the parking brake, then by reaching over and attempting to apply the brake himself. By the time the brake was finally activated the damage was done.

Complacency, coupled with unwarranted assumptions, led to another incident that might easily have been prevented. Being able to maintain a proper lookout as well as constantly monitoring cockpit procedures should be second nature for all plane commanders regardless of their model aircraft.

Our Mistake

APPROACH apologizes to VMGR-252 for their having been omitted in the list of CNO Safety Award winners for 1969 published in the October issue. A slip substituted VMA-311 for VMGR-252. Congrats to VMGR-252 – keep up the good work. (Also it is noted that VMGR-352, winner in FMFPAC was erroneously identified as UMGR-352.)

A-7A Canopy Loss

THE A-7A pilot was maneuvering in a port turn in order to keep another aircraft within sight. As the pilot shifted his body to the right, the canopy separated from the aircraft. The pilot stated that he had inadvertently opened the canopy by hitting the canopy release handle with his arm.

All pilots should be aware of the ease with which this canopy can be opened. The location of the handle, when out of the fully stowed position, is such that a pilot can inadvertently unlock the canopy while performing operations within the cockpit. In this incident the pilot noted that the canopy handle was approximately three quarters of the way down (out of the stowed position).

You Never Fly Alone

NEWS media have bombarded the American public for months with various aspects of airspace congestion, saturation in high density terminal areas, increases in air traffic flow, out-of-date air navigational aids and inadequate airports. Sharply worded articles have appeared, reporting pros and cons, in the dispute between general aviation and air carriers about increased aviation gasoline taxes and airport usage. PATCO (Professional Air Traffic Controllers Organization) has been on the front page frequently in its dispute with "management." Directly or indirectly, all of this affects the military pilot too.

Air Traffic Growth

The FAA reports a steady 10 to 15 percent increase in air traffic each year. This is based on reports received from those airport towers operated by the FAA (over 300). If anything, the reported increase is conservative. There are far more airports without towers than there are with. Flight operations in the Navy are easier to keep tabs on and generally there is less than 10 percent fluctuation in flight operations from year to year.

Some Aspects

A cursory study was made using FAA statistics in order to see what the naval aviator was faced with in certain selected areas once he became airborne. The box below contains an explanation of the source of the statistics and how the figures which are depicted in this article were constructed.

Continued

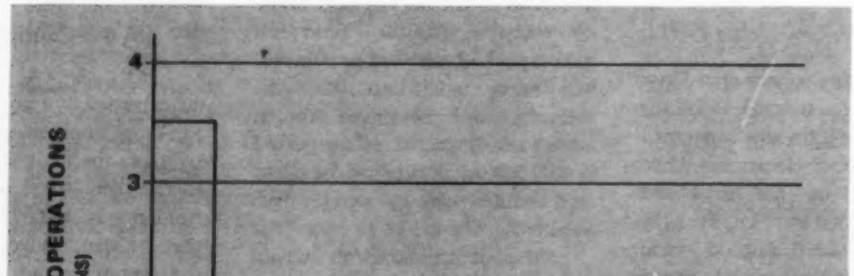


Fig. 1

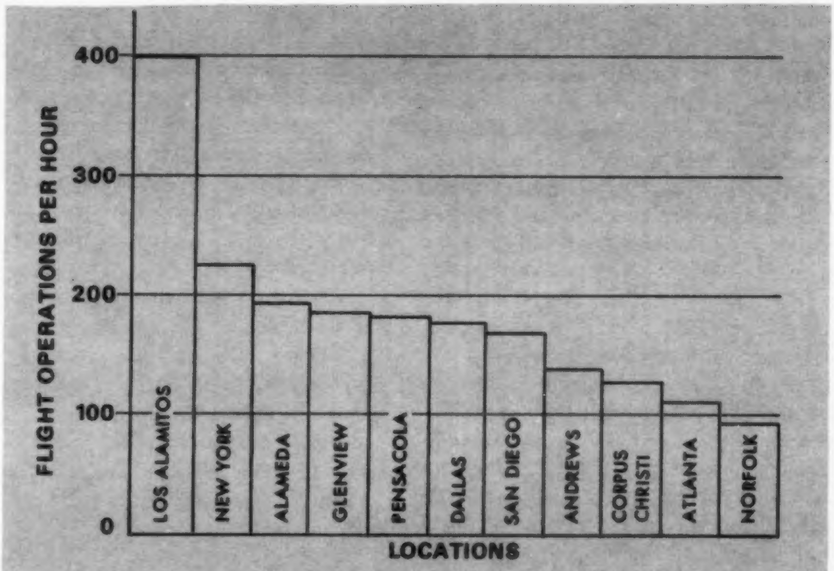


Fig. 2

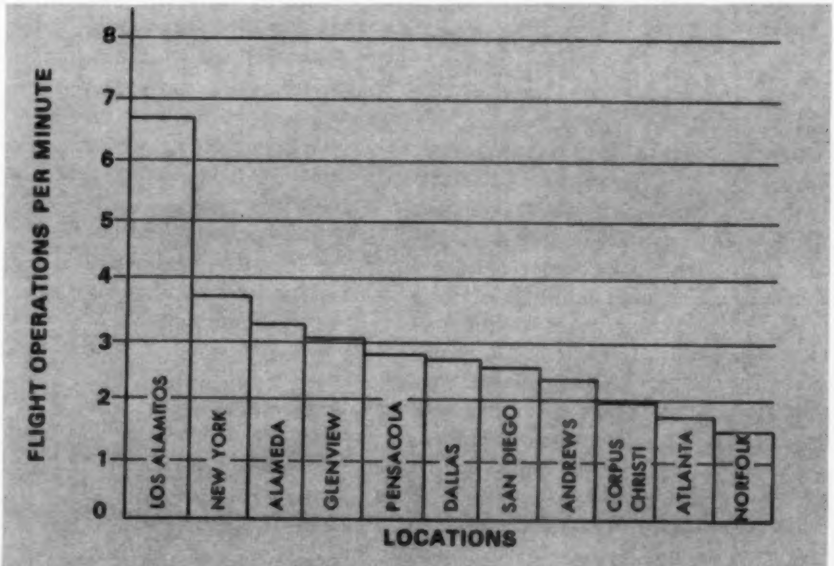


Fig. 3

Information and statistics portrayed in Fig. 1 through Fig. 3 were extracted from calendar year 1968 "FAA Air Traffic Activity" and "Military Air Traffic Activity Report" both issued by the FAA. The statistics for all areas are representative only. In each area there are uncontrolled airports whose flight operations* are not included. In each area depicted, an arc of 25/30 nm was swung from the selected Naval Air Station and all airports within the circle were used to determine flight operations in that area. Hourly flight operations were determined by using a 360-day year (8640 hours).

*Flight operations, in this context, means landings and takeoffs — not flight hours.

For example, the busiest area in the United States is southern California. As shown in Fig. 1, within a radius of 25 nm from NAS Los Alamitos there were 3 1/2 million flight operations last year. This further breaks down into 400 flight operations per hour or almost 7 per minute the year around. In case any reader cares to question the "preposterous" number of flight operations in the NAS Los Alamitos area, be advised that this does not include Van Nuys or Burbank airports. If those two airports had been included in the NAS Los Alamitos area an additional million flight operations would have been shown.

As with any statistical breakdown certain unknowns or inconsistencies creep in. For example, some civil airports may operate a limited number of hours per day; so, the bar graphs in Fig. 2 and Fig. 3 are inaccurate for this reason. Another inaccuracy is that no attempt was made to add in those aircraft that were transiting the area. Overflights, of course, add to the congestion in all areas. From the information shown in the figures you can see that total saturation may be a long way off but, by the same token, there is no doubt that certain areas are marked by very heavy flight operations.

Other Aspects

One statistic released by the National Transportation Safety Board which is of interest to every naval aviator is that a 50 percent increase in civilian mid-airs occurred in 1968 over 1967. There were 38 of them – one involving a military aircraft. A recent report released by the FAA concerns the NMAC (Near Mid-Air Collision) study. An important fact easily deduced by those who read the report is that the see-and-be-seen concept is becoming outmoded and incompatible with the tempo of flight operations today. More stringent control of air traffic will most assuredly become a reality in certain high density areas. The number of NMACs reported were over 2200 with the greatest number occurring in the New York, Washington, Chicago, Los Angeles, San Diego and San Francisco areas. Strangely enough, 95 percent occurred in VFR weather conditions and not so strangely, two-thirds were in terminal areas and (get this) the majority of these involved enroute traffic through the terminal area and *were not known to air traffic control!*

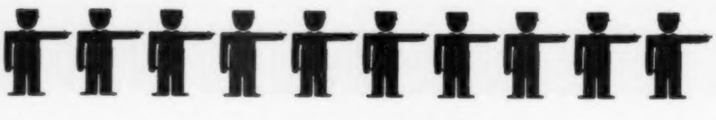
Look Alive

It behooves every naval aviator whether at Homeplate, off on a cross-country or around the ship to maintain maximum vigilance. Keep that head out of the cockpit and on a full swivel. The best airborne CAS (collision avoidance system) right now is the Mk-1 Mod 0 eyeball. Maybe before too long there will be a black box to help too. Observe the following steps to fly as safely as possible:

- Head up and swivelling at all times except in solid IFR conditions.
- File IFR on all extended flights and fly precisely – on altitude, on the correct heading and radial and on airspeed.
- Head up and swivelling.
- Post lookouts if available and in multi-place cockpits share the duties to keep at least one set of eyes out of the cockpit.
- Comply with airspeed restrictions at various altitudes in terminal areas.
- Execute prompt turns, climbs or descents when directed by approach control or center.
- Head up and swivelling.
- Report on the proper frequency and at the time/place appointed.
- When reporting out of an altitude for another assigned altitude ensure you have vacated before reporting.
- Head up and swivelling.
- Clear the area before making any turns and especially before performing any aerobatics or ACMs and only perform them in those areas set aside for them – never within a control zone or on a federal airway.
- Be especially alert when transiting heavy student training areas and in all terminal areas.
- HEAD UP AND SWIVELLING.

Sharply worded articles have appeared regarding solutions to these problems. Most suggestions will take study, money and time before being implemented. This article stresses a small step you can take immediately to improve safety (especially your own).

PASS IT ALONG!



Each copy of APPROACH is meant for ten readers.

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EAC?

What does it mean to you?

OUR answer to a question which was printed in the article, "On the Glide Slope," on page 23 of the January 1969 issue of APPROACH has resulted in considerable reader interest. The question and our answer are reprinted below:

Q: When a pilot has been issued an expected approach clearance (EAC) time, should he plan to be at the holding fix or the initial approach fix (IAF) at the EAC?

A: For tacan holding patterns where the IAF is not within the confines of the holding pattern, the aircraft should maneuver to be at the holding fix on the EAC time. If the IAF is located within the published holding pattern, the aircraft should be at the IAF on the EAC time.

Shortly after APPROACH hit the streets, several phone calls and a couple of dissenting letters were received questioning the accuracy of our answer. As a result, a survey was conducted to determine if we all have the same understanding. We don't. So . . . . the decision was made to more closely examine the situation and pass along the ungarbled word. Here are the results of research on the subject by Mr. Hank Holder the FAA Liaison Officer at the Naval Safety Center:

Both the Flight Planning Document and the FAA Air Traffic Control Handbooks define EFC (expected further clearance time) and EAC (expected approach clearance time). The difference between the two is that the EFC is the time at which it is expected that additional clearance will be issued and EAC is the time at which it is expected that the aircraft will be cleared to begin an approach. EAC and EFC are not defined in the FARs (Federal Aviation Regulations) because they are considered to be self-explanatory. Quite simply, a controller will issue an EAC, instead of an EFC, when it is necessary to hold an arriving aircraft and the time at which an approach clearance may be issued can be estimated. The location of the holding fix in relationship to IAF is not a controlling factor.

We will cite the three situations which may be encountered but first let's state a few ground rules to ensure clarity: (1) radio failure is not involved; (2) "No delay" clearance limits are not involved; (3) the cases cited do require that the pilot plan ahead in order to determine:

- The time his flight should be over the clearance limit, or,
- What time he should contact the controller for further clearance/information

(4) in all cases a clearance is required before leaving the holding pattern.

First, let's take the case where the holding fix and the IAF are collocated. A good pilot operating practice is to plan the holding pattern flight to position the aircraft over the fix at the EAC time.

The second case is where the IAF is located outside of the holding pattern. The pilot should plan the holding pattern flight to position the aircraft over the holding fix at the EAC minus the time it will take to travel from the holding fix to the IAF.

The last case is where the IAF is located within the confines of the holding airspace but not collocated with the holding fix. Unless an approach clearance has been received, the pilot should maneuver the aircraft to be at the holding fix at the EAC minus the time it takes to travel from the holding fix to the IAF. Why? The two reasons are: (1) the next clearance may be for a continuation to hold and (2) proceeding to the IAF may inadvertently cause the pilot to operate outside the confines of the holding pattern airspace protected area.

The controller has no set time to issue an amended EAC. However, he should issue an amended EAC, a clearance beyond the holding fix or an approach clearance prior to the expiration of the EAC or EAC minus the time it takes to travel from the holding fix to the IAF, whichever is appropriate.

What should the pilot do as the EAC approaches? A set rule is somewhat impractical. Obviously, if an appropriate clearance or other instructions are not received as time runs out, the pilot should make an inquiry just prior to the EAC or EAC minus the time to travel from the holding fix to the IAF, whichever is appropriate. However, if the pilot hears the controller updating EAC times of aircraft which are ahead of his flight, common sense indicates that the pilot continue to hold and await a new EAC time.

In summary, plan ahead as illustrated in the three cases cited, in order to be at the clearance limit fix at the time appropriate to the situation, contacting the controller whenever additional clearance or updated information is needed.

C

Words of Wisdom by an 'Old Timer' - - - Major General M.E. Carl, USMC

THIRTY YEARS AGO aviation was something of an art. There was nothing of significance in the cockpit to help you. You flew by the seat of your pants from necessity. As a result, the approach to flying was not too serious or scientific, and the accident rates reflected it. However, today's flying, particularly in the military services, is a science.

When I review the accident records for years past, I note that certain squadrons consistently maintain low rates while others do not. On the surface all squadrons would appear to have equal assets, but their comparative performance would indicate that this is not necessarily so. Lady Luck might be the difference in a given instance, but when long term records are considered, she loses her significance. Why this difference in accidents among squadrons and what can be done about it? At times the shifting of a few key personnel has made the difference. In other situations it has taken a complete change such as the re-forming of a squadron. Although re-forming has never been done solely for this purpose, I can recall changes that have occurred when a squadron has been re-formed with new personnel and equipment. This in itself though is not a guarantee.

We must first consider the factors that affect safety. Initially, the airplane must be properly designed to effectively perform its mission with minimum maintenance. Improving this factor is beyond our immediate influence, as is the availability of spare parts and proper support equipment. Next comes supervision and maintenance. Both are commented on in an accident report. These are within our control and are the direct responsibility of the squadron commander. Proper supervision can compensate for certain other deficiencies such as lack of trained personnel, lack of proper equipment and poor working conditions; most important of all, proper supervision can insure good maintenance in most difficult situations. Particularly at this time, when we have such a high personnel turnover and therefore lack the stability that is desirable, supervision is more important than ever.

Most of us remember the adage about there being no old-bold-pilots. There are a few still around who, when younger were much bolder than necessary. They are the lucky ones. They have long since quit flying, or if still flying, have mended their ways. They experienced a change in what I think is the most important factor influencing safety – ATTITUDE. This trait can apply to the individual or the entire organization. It is my firm belief that attitude is the major factor which distinguishes an outstanding organization from a mediocre one.

Each Marine must strive to learn as much about his job as possible. He must take pride in his work, and regardless of what his job in the organization may be, he must feel that it is important and that it must be done right. If the cook in the galley and the clerks in the office do their jobs right, then the men on the line will feel more inclined to do likewise. If the men on the line and in maintenance do their jobs right, the aircrews can concentrate on mission performance, and the result will be safe, productive flights. This is what we must strive for, and this is what we must have, furthermore, it is the responsibility of *all* supervisory personnel not only to instill the proper attitude and sense of pride in their squadron, but to back this up by insisting upon and accepting only performance which meets our high standards both on the ground and in the air.

Our aircraft are sophisticated and expensive and only a professional attitude and approach to both maintenance and flying will provide the required results.

These excellent words apply throughout the aviation community. – Ed.

OMMAND ATTITUDE

HOW READY ARE YOU?

By LT T. L. Nelson, ASO, VA-97

THE brief had gone well and the flight progressed as planned. The pilot departed the Marshall pattern on time and commenced his night Case III approach to the CVA. The ball was acquired, went a bit low, then high and the result was a bolter.

As the pilot turned downwind he raised his gear and PC-2 pressure began to drop rapidly. He then raised his flaps and the aircraft began a port-wing down descent. The pilot was able to start the aircraft climbing again as the pressure altimeter reading decreased *from 100 feet to 25 feet*. He then climbed to pattern altitude, continued downwind, dropped his gear and flaps normally (with PC-2 pressure still dropping) and made an uneventful arrested landing.

Your first reaction to this probably is *wow*! But let's analyze the problem. The only damage done was a blown hydraulic seal and a badly embarrassed aviator. But there is a little more to be considered.

Some serious errors were made by the pilot. He should never have raised his gear in the bolter pattern unless for a specific reason. The pilot stated that he was so accustomed to raising his gear after a GCA that it was almost automatic.

Once the PC-2 system began to fail he should not have raised the flaps, especially in a turn. The hydraulic leak was in the starboard aileron area, hence the heavy left wing descent. The port flaps came up as scheduled but the starboard flaps were slow to retract and the pilot thought he had control difficulties (which he did, but not for the reasons he thought).

As the pilot was flying downwind he should have used the emergency system to lower both his gear and flaps.

Additionally, the pilot *never* informed anyone of his problem.

You probably also wonder – should he have ejected? The pilot said he could see the reflection of his lights on the water and he had given some thought to ejecting but his "pride" kept him from doing so for that small amount of time it took to get control of the aircraft.

By improper procedures this pilot snowballed himself into a situation that could have cost him his life. It is difficult to argue with success since the airplane and pilot are both back aboard. The pilot made one overall remark about the situation – "If I had just used common sense it would have been nothing more than a PC-2 failure."

None of us can honestly say whether we would have stayed with the aircraft or not. We would probably say, "Don't get caught in a position of this type." Very true, – don't make a bad situation worse but how prepared are you? Do you know your emergency procedures well enough so that when the situation does arise you think clearly and act precisely. There can never be too much thought or practice of emergency procedures and headwork in professional aviation.

Be prepared for the unexpected. *You* may not be lucky enough to see 25 feet on your altimeter at night and live to tell about it.

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SAFETY SERENADE

We can build a safety program, and
show that safety pays,
We can organize for safety in a
hundred different ways,
We can hang our safety posters far
and wide through every place,
We can quote our regulations
'til we're purple in the face,
We can hold our safety meetings
every morning in the week,
And nod in bland agreement while
the Supervisors speak.
While these things contribute greatly
to the goal we must achieve,
We'll never be completely safe
until all hands believe:
That accident prevention holds a
challenge for mankind,
That safety is an attitude, a healthy
state of mind.
It's something you can't legislate,
no matter how you try it
And though you're wealthy as a king,
you'll find you cannot buy it.
It's something you can't force upon
a mind antagonistic,
Nor can you win a doubting soul
by quoting a statistic.
But every man can use it in the
hectic daily grind
To guarantee security and give him
peace of mind.
For safety isn't just a word —
it's more a way of life;
It helps avoid the grief and woe,
the care and doubt and strife
That is the lot of some who scoff
at accident prevention
And sometimes have to settle
for a disability pension.
A whole new way of life is yours in
safety consciousness,
And in its sphere there is no room
for chance or thoughtlessness.
So join the safety movement,
lift yourself above the throng.
As you set a good example, others
then will go along.

National Safety Council
Safety Newsletter

midair collisi

THIS PICTURE was constructed by the aircraft accident board following the accident and illustrates what is believed to have been the relative positions of the two A-7 aircraft a split-second before impact. Immediately after impact, one pilot was involuntarily ejected from his aircraft. This is believed to have been the result of contact between his ejection seat face curtain handle and some part of the aircraft with which he collided. Although the pilot was rendered unconscious by the impact, the ejection was successful. Nevertheless, he suffered major, permanent injuries as a result.

The other pilot involved remained conscious (and aware of his situation) following the impact.

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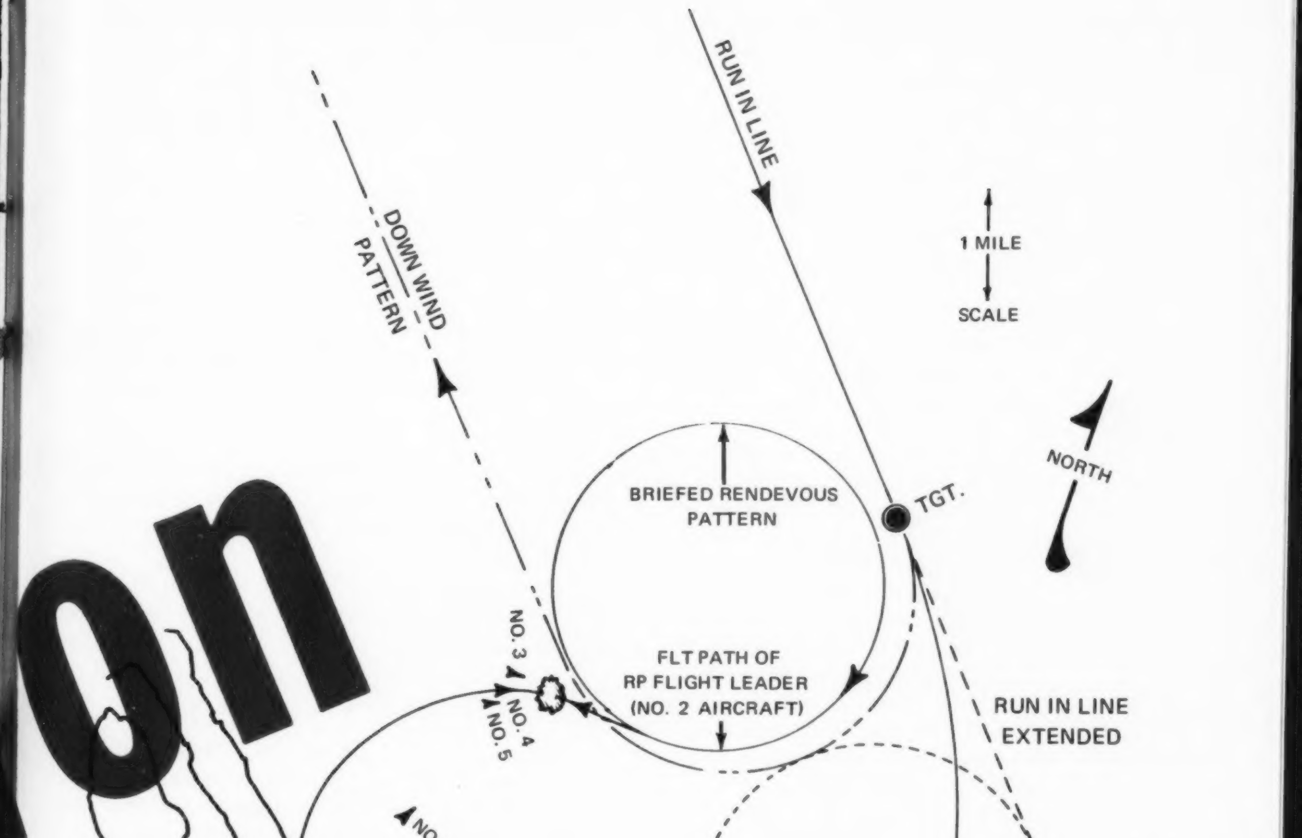


CHART DEPICTING ESTIMATED FLIGHT PATHS OF AIRCRAFT PRIOR TO AND AT THE TIME OF MID-AIR COLLISION BETWEEN AIRCRAFT NO. 2 AND AIRCRAFT NO. 4

NOTE: THE INSTRUCTOR PILOT, IN AIRCRAFT NO. 1, WAS ORBITING AND OBSERVING ABOVE THIS PATTERN

Continued

Recognizing that his aircraft was uncontrollable, he ejected 3-5 seconds later, suffering only minor injuries.

Events Preceding the Collision

The two colliding aircraft were part of a six plane flight, consisting of five RPs (replacement pilots) and an instructor pilot. The instructor pilot (aircraft No. 1) led the flight through one practice bombing run, then departed the pattern to orbit overhead and observe the rest of the flight as they continued their bombing practice.

The leader of the remaining five RPs (aircraft No.2) made his final bombing run, called off target and proceeded to the briefed rendezvous pattern (see diagram). The pilot of aircraft No. 3 completed his run, pulled off target and called the RP leader and requested his position. In the meantime, he delayed his turn, resulting in a flight path well to the south of the briefed pattern (refer to diagram). The RP leader reported his position was west of the target and halfway through the turn (meaning the rendezvous circle). Shortly thereafter, the RP leader requested No. 3's position and received the answer that he was "south of the road."

Next, No. 4 aircraft in the flight pulled off the target, turned out as briefed and reported that he had the No. 3 aircraft in sight and was joining on him. No. 5 aircraft soon came off the target, sighted the two aircraft in formation and proceeded to join on them. The sixth (and last) aircraft in the flight then called off the target.

About this time the RP leader (No. 2 aircraft) again requested No. 3's position. No. 3 reported, that he was over the foothills of a mountain range west-southwest of the target. By this time, the No. 4 and No. 5 aircraft were joined on No. 3 aircraft in a right echelon free cruise formation. The instructor pilot (aircraft No. 1) at this time was orbiting overhead, well above the flight and observed the RP leader as he momentarily rolled out of his starboard rendezvous turn to a wings level attitude in an attempt to sight the No. 3 aircraft. The instructor pilot also noted the other three aircraft in right echelon formation and recognized that they were closing the RP leader head-on. He transmitted on the UHF, "Heads up, you have aircraft coming at each other." The RP leader (aircraft No. 2) and the No. 3 aircraft (who was now leading aircraft Nos. 4 and 5) sighted each other with an estimated one mile or less of separation. The RP leader made a 2 to 3 G pullup to starboard in an attempt to clear the three plane echelon but collided with the No. 4 aircraft (the second plane in the echelon). Up to the moment of collision, the No. 4 pilot's attention had been engaged in flying wing and he never saw the RP flight leader with whom he collided.

This accident was caused, in part, by the failure of the No. 3 man in the flight to fly the proper (briefed) rendezvous pattern, in spite of having received a thorough preflight brief by the instructor pilot. The flight surgeon's comments in the MOR are of considerable interest:

"His (the pilot's) failure to comprehend the briefed rendezvous pattern stemmed not so much from neglect or inattention at the brief per se (he was noted to appear attentive at the brief) but rather from a different combination of circumstances. He had just reviewed a *different* rendezvous pattern immediately prior to the brief, which he thought would be the one used. The best analysis of the situation which we can reconstruct is that he looked at the rendezvous circle as drawn (by the flight leader) on the blackboard but did not see what he was looking at, i.e., he *expected* to see the pattern he had just reviewed and *expecting* to see it, he believed he saw it *although it was not physically present on the blackboard.*"

This pilot was also described by the flight surgeon as a conscientious, well-motivated naval aviator. This points up the fact that we must strive to be alert to the situation at hand and never let down our guard by becoming creatures of habit or victims of preconceived notions.

While the No. 3 pilot's error in flying the incorrect rendezvous pattern was a definite contributing factor, a senior endorser to the AAR assigned the RP flight leader's performance as a major cause factor in this accident. His endorsement stated, in part:

"The incorrect rendezvous pattern as established by the No. 3 pilot certainly served to create an environment which was potentially hazardous but from which professional airmanship should have allowed an uneventful recovery. The fact that the RP flight leader did not initiate more precise action in regrouping his flight as soon as it became evident the briefed rendezvous was not being effected and that he further failed to notice the flight in the head-on situation until that instant which allowed little more than a pure reactionary maneuver, renders his performance a major contributory factor in this accident."

A Good Lookout is Essential

There are many potential circumstances which can combine to create the threat of a mid-air collision (as in this case). But, whatever the circumstances surrounding any particular flight, the very best protection against mid-air collisions is still a good lookout. This is especially true where aircraft are rendezvousing following separate tactical maneuvers.

ON THE GLIDE SLOPE

CCA

Perfecting the Approach

THE CCA (carrier controlled approach) is an exacting phase of carrier operations and demands precision flying. The naval aviator who cannot fly a near perfect CCA is infamous with his fellow pilots, despised by the CATCC watch officer and a hazard to himself.

The CVA/CVS NATOPS Manual is the gouge used by all ships for aircraft recovery procedures. Rather than restate what is clearly defined in that manual, this article emphasizes the importance of timely and precise execution of procedures – from Marshal to meatball acquisition.

Marshal

The holding (Marshal) pattern is a six-minute pattern as depicted on the appropriate approach plate. The pilot must maneuver his aircraft within the holding pattern as necessary in order to cross his exact holding fix at the EAT (expected approach time) on proper airspeed and at the assigned altitude. The goal should be to fly a pattern which will have the aircraft crossing the initial approach fix at the EAT plus or minus five seconds.

While in Marshal, altitude must be carefully maintained since fixed-wing aircraft are stacked with only 1000 feet vertical separation and helicopters are stacked with only 500 feet separation.

Being properly set up at the beginning of the approach is as important to a good CCA as a good 180-degree position is to a successful VFR approach.

The Penetration/Approach

The descent to meatball acquisition altitude must be accomplished with all similar type aircraft flying the same airspeed and rate of descent, as specified in the CVA/CVS NATOPS Manual. To emphasize this point, consider jet aircraft which penetrate at 250 kias and 4000 feet per minute. Each aircraft is departing Marshal at one or two minute intervals (depending on ship's policy). If one aircraft departs the fix 30 seconds late and flies 225 kias while the next aircraft departs 30 seconds early and flies the specified 250 kias, the subsequent "passing in the night" may be more than uneventful. Although the ship's radar controllers may observe the situation developing and issue separation vectors, a lost communication situation places the pilot on his own – dependent on precise airmanship for a successful approach.

Proper interval is a must and if it is not established by *Gate Six*, the subsequent ramp interval will also be erratic. If the interval is too close, foul deck waveoffs will result; if it is too great, open deck time will not be efficiently used and the recovery operation will be unnecessarily extended.

The Final Approach

The six-mile gate marks the start of the final approach. If a precision or AWCLS (all weather carrier landing system) Mode IA or II approach is to follow, the aircraft should pass through the six-mile gate at 1200 feet and 150 knots in the landing configuration and slow to approach airspeed. The 1200 foot altitude must be maintained until the final controller tells the pilot to descend or the cockpit indicators indicate the glide path has been intercepted. Anticipation of the glide path or peeking for the meatball at this altitude can easily result in disorientation and vertigo so it behooves the pilot to remain on instruments throughout the approach. The final controller will guide the pilot down to meatball acquisition, LSO takeover or minimums for the approach. With a non-precision final, the aircraft descends at the six-mile gate to 600 feet and maintains that altitude until visually acquiring the meatball or the LSO takes over.

The entire CCA requires the most exacting instrument flying by each pilot in order to become a smooth operation and result in those "OK" landings.

If you have a question concerning any phase of instrument flight for which you cannot find a satisfactory answer, send it to the Commanding Officer, VA-127, NAS Lemoore, Calif. 93245, who has volunteered to do the necessary research and supply the answers.

How, Now, LSO

WHAT kind of a day was it? A day like most days out here – filled with events that alter and illuminate our times. I know because I was there. I was an aircrewman in an EA-1F on a routine flight in the Tonkin Gulf. We had completed our mission and were on the way back to the carrier for landing with an approach time of 0442. We departed the gate on time; however, at eight miles from the ship we were advised to orbit because a couple of jets ahead of us had boltered and were using some of our airspace. After a few minutes we were told to continue. At about five miles from the ship we found ourselves flying alongside an E-1B at the same altitude but about 75 yards to his starboard. At this time CCA told the *Fudd* to turn *starboard* and *us* to turn *port*. It was still dark but we had each other in sight. I just wonder how, had we been in clouds or had we not sighted each other, a midair could have been avoided. Although we figured this near midair was enough excitement for one flight it wasn't anything compared to what happened next. We were cleared to continue "once more" but then a third time we were instructed to orbit. Each time we were told to orbit we were advised to raise our gear. We were then cleared on final and told to check our gear down

and locked. At less than half a mile from the ship an A-4 suddenly appeared in front of us. As my pilot turned to miss the jet he raised the gear and started a waveoff. However, the A-4 was waved off and we were told to complete our approach. We did. We made a smooth landing, caught the number two wire – but the only thing wrong was that the wheels were still in the well. I recommend more coordination by CCA and closer monitoring of landing aircraft from the LSO platform.

Spadmouse

This was a poorly organized operation from the beginning. Three wrongs will never make one right. The third wrong was committed by the A-1 pilot when he did not take a waveoff. Night carrier landings require maximum concentration under optimum conditions and any distractions are stacking the odds the wrong way.

Carrier operations have always

ANYMOUSE

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. As the name indicates these reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

— REPORT AN INCIDENT, PREVENT AN ACCIDENT —

been the most demanding phase of Naval Aviation. The addition of night operations and a confused pattern demand the utmost of a pilot's ability and the finest sense of teamwork between pilot, LSO and CATCC.

In this case it would have been best for either the CCA controller or the LSO to have called for an additional gear check. It would also have been wise for the pilot or you, as the other occupant of the front seats, to initiate a review of the landing checklist to ensure that the gear, flaps and hook were properly lowered.

Never assume – always check.

. . . Turn Off Next Exit

OUR cross-country hop had gone as planned. The traffic was heavy at our destination – a large and unfamiliar civilian field. The tower advised us not to wave off unless critically necessary. The runway was long and the approach was flown about 5 knots too fast. After commencing rollout the tower advised, "Turn off at the next exit."

The pilot jammed on the brakes and raised the flaps to aid in braking effect. Heavy braking was required and the pilot braked so hard that the brakes started smoking. We made the turnoff that the tower wanted. Postflight inspection revealed a leaking right brake assembly caused by a loose bolt which was tightened and safety wired for us by the civilian ground shop. The brakes were still smoking several minutes after shutdown. *Moral:* It might be helpful to remind all pilots that tower instructions to turn off while rolling out do not have to be obeyed if speed is excessive.

Corpus Mouse

Your letter (moral) did hit home on an important point. The

instructions from the tower should be obeyed except that pilots need never compromise safety with requests to expedite. It is incumbent upon pilots to comply with tower requests whenever speed and conditions permit. Another point that you didn't mention is the all important cooling off period for those brakes. It is hoped that no one was permitted anywhere near the aircraft's landing gear until those brakes cooled off. Tires have been known to blow out and wheels explode several minutes after a plane has been chocked.

Inadequate Cockpit Briefing

THE flight in the P-3 was to be a NATOPS check and the pilot receiving the check was scheduled to become the new squadron NATOPS officer. The flight engineer involved had recently returned from 30 days leave. He had flown only once since then and was looking forward to the flight because it would provide the opportunity for a good review of emergency procedures. Preflight, engine start and taxi all went smoothly. As the aircraft took the duty runway for takeoff, the pilot in the left seat mentally reviewed the standard procedures for takeoff and the handling of any emergencies prior to becoming airborne.

One hundred knots was designated as refusal speed and the aircraft commenced its takeoff roll. At 110 knots the instructor in the right seat retarded the No. 1 power lever to FLIGHT IDLE. The *alert* flight engineer yelled, "Power loss on number one." The *alert* pilot in the left seat yelled, "Feather number one." The *alert* flight engineer pulled the emergency handle for the number one engine.

The aircraft then became safely airborne with the stunned group of three just sitting there looking at each other; the flight engineer blushed, the instructor pilot turned purple from rage and the student pilot paled at the realization of what had occurred. The aircraft then was flown around in the pattern, landed and taxied to the far end of the field. The engine which had been shut down was restarted and the flight continued after a thorough discussion of what each person was to do during simulated and actual emergencies.

The item that was lacking is obvious: The instructor pilot had failed to brief the pilot being checked and the flight engineer on the *simulated* emergency. A good briefing and a meeting of minds between the instructor pilot, the pilot being checked and the flight engineer should have occurred prior to arriving at the aircraft. This should have included briefing of procedures and assignment of responsibilities for simulated and actual emergencies.

ASO Mouse

Amen!

Birds on t

Purple Fubar

This is a bird noted for its consistent slight miscalculations. Purple Fubars have been known to gage their takeoff runs erroneously and fall pell-mell from high trees, causing much disturbance to their plumage. They also have been noted, on occasion, to extend their main mounts somewhat late for landing, causing considerable soreness to knees and shins. But far and away their worst fault is that of initiating landing transitions from either too high an altitude or too great a distance from the selected landing site resulting in extensive beak and tail feather damage.

The Double-Crested Guinea Gump

This most unusual bird flies, not in the conventional manner by flapping its wings up and down, but rather by swirling them in great arcs around its body in opposing directions. It performs quite well while actually flying (barring some isolated cases of forgetting which way to swirl which wing) but has extreme difficulty when walking on the ground to and from its earthbound nest. It seems that the Guinea Gump frequently gets off balance, causing one or both wings to strike the earth or whatever other obstacles are around, propelling the Gump into great gyrations, and stirring up much dust and flying debris. Guinea Gumps also have frequently been noticed to walk too close to other Guinea Gumps. This is awfully rough on Guinea Gump wings.

the Wing

The Barrel-Chested Blabber Bird

This annoying creature is perfectly silent at all times and in all places about all things — until it decides to fly. Then its sound box is directly geared to its wings, and never once does it shut up at any moment while it is airborne.

Blabber Birds are subject to much abuse from other larger birds because Blabber Birds can never hear warnings of impending attack over the sound of their own voices.

They also contribute to some of the difficulties experienced by the Purple Fubar in that they drown out calls of "power" and "attitude" made by LBO's (landing bird officers) to Fubars that are about to land short. Blabber Birds also seem to have an affinity for pointless transmissions on 243.0.

Low-flying Green-faced Morning Bird

This is a bird that flies low and slow in the early mornings after just having returned to its nest from fast, high-flying nights. Beware of this bird and remain well clear — it often isn't paying very close attention to what it should be paying attention to — flying — and even if it were paying attention, it couldn't fly very well. Its reflexes are similar in speed to that of cold molasses, and its double vision makes takeoffs, rendezvous and landings quite testy.

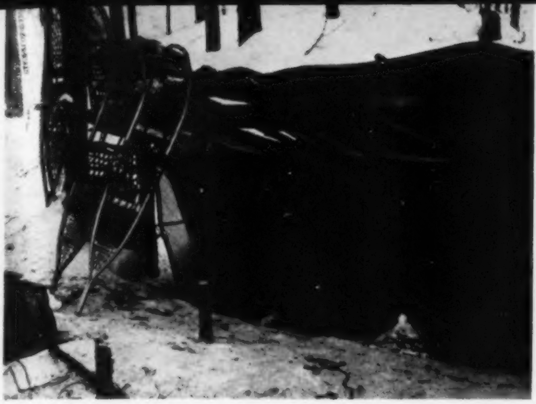
The Orange and Black Striped regiT* Bird

This airborne menace has a most interesting (and frequently disastrous) habit of hurtling about through the skies with its eyes closed, oblivious to any dangers or hazards in its area. Frequently the regiT bird exceeds its capabilities and clangs into rocks, trees and even the waiting paws of neighborhood tomcats. The regiT bird has an extremely short life span and some members of the Audubon Society voice the opinion that it soon will become extinct. (Let's hope so!)

***A Backward Tiger**

Snowshoes are a must for travel in snow country. You may not be lucky enough to have commercial snowshoes with you when you bail out but they can be improvised from many items on hand. These were made from green branches and parachute shroudline.

there's no business like



The para-lean-to can be rapidly constructed by one man. It can be made large enough to accommodate many. It is a very effective shelter in all types of weather.

SNOW BUSINESS

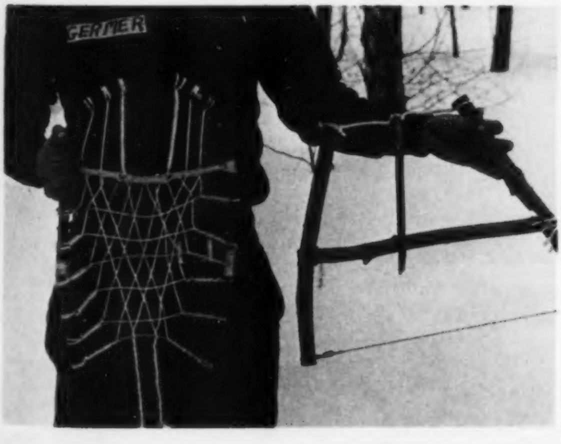
Text and photos by LTJG P. C. Anderson and PH2 D. J. Gloistein, Fleet Airborne Electronics Training Unit Atlantic, Detachment Brunswick

A CHILL factor of -50° F is not uncommon at 45° north latitude during the winter months. Such extremely low temperatures can cause death or permanent physical injury in a matter of minutes to a person unprepared for such extremes.

Teaching pilots and aircrews the skills required for survival in an arctic environment is the business of the Fleet Airborne Electronics Training Unit Atlantic, Detachment Brunswick, located in the southeastern portion of Maine. The Cold Weather Survival Course takes five days, which includes one day of lectures and four days of field work and practical experience.

Briefing begins with a presentation covering the psychological and physiological aspects of cold weather survival. Basic skills of survival – fire building, shelter building, first aid

Boiling is the best method for preparing your food. It retains all of the natural juices and you do not lose the energy contained in the fat that would be wasted in the fire due to dripping if the meat were roasted or broiled.



Your imagination and the materials you have on hand are the only limiting factors for improvised equipment in a survival situation. Shown here along with the snowshoe is a handsaw made from sticks, shroudline and the wire saw found in your SEEK-2.

A fire can serve many purposes. Besides providing heat and cooking your food, it is a great morale builder. Knowing how to properly construct a fire can save you time and conserve your valuable matches.

and individual medical care, and procurement of food and water are discussed in great detail. Different methods are taught in each survival category so that aviators and air crewmembers will be prepared for most situations which they might encounter. Many other skills such as ground-to-air signaling, overland travel procedures and the many uses of a parachute are covered in following sessions. The day of briefing ends with a tour of the display room for a look at the survival tools improvised by former students. During the course the men are expected to construct survival tools and gadgets which will aid them in self-preservation.

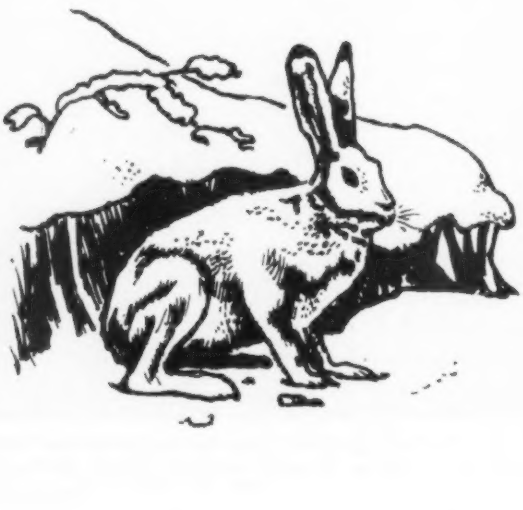
The white smoke produced by green pine boughs can be colored in many ways. Rubber or oil from the aircraft will make the smoke black or the day end of a Mk-13 Mod 0 signal flare will make the smoke bright orange.

Signaling is vital. If you can't let someone know where you are they can't come and pick you up. Many methods are available. One of the best for tree country is a smoke type signal fire. Smoke rising above treetop level can be spotted for miles. However, care must be taken to prevent starting a forest fire.

Continued

Water is of prime importance to the survivor. In the winter months it may be more difficult to obtain. Ice and snow, while frequently in abundance, should be thawed before use, requiring a fire. The body temperature may be dangerously lowered and the tissues and membranes in the mouth and throat damaged if ice or snow is consumed in other than extremely small quantities. (Ref. Survival Training Guide, NavAir 00-80T-56)

Medical items can be improvised from nature such as this splint made from birch bark and parachute fabric.



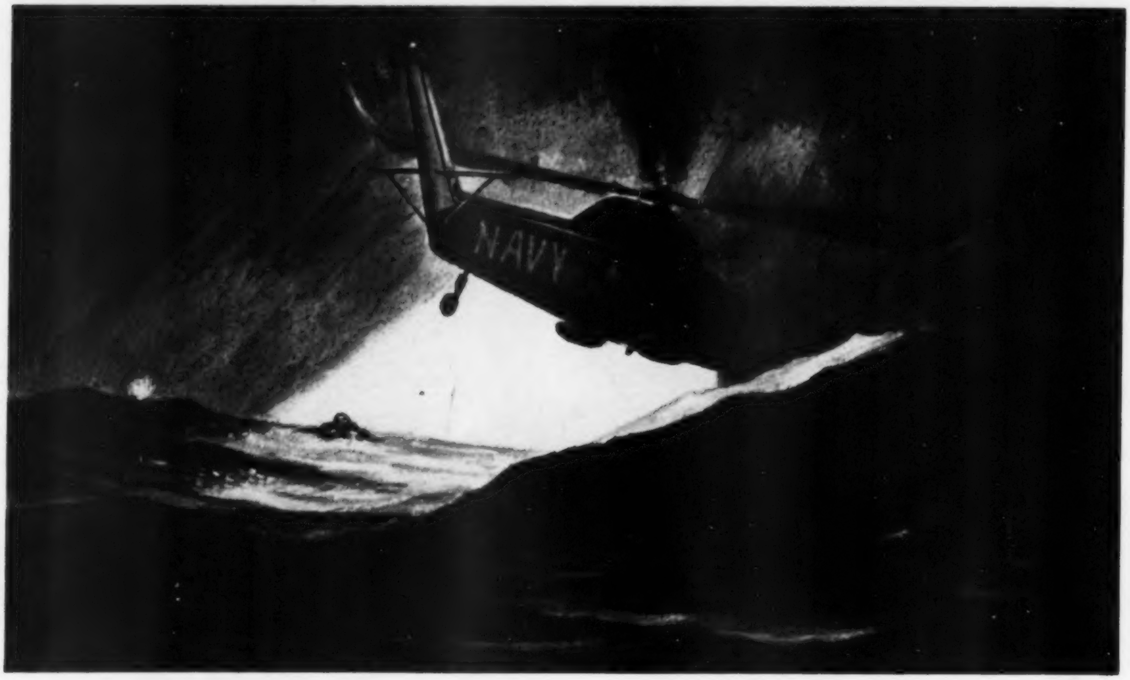
Dawn of the next day finds the crewmen treking to the survival area, putting into practice principles of overland navigation and travel which were discussed the previous day. During the hike, instructors point out different food sources and explain various means by which food can be prepared.

Once in the general survival area, students erect shelters and prepare to evaluate many of the survival techniques and principles explained earlier. Under the supervision of experienced instructors students use the skills they have learned to live off the land for the rest of the week. They find, obtain and prepare their own food, generally experiment with techniques learned and practice these techniques in preparation for a possible actual survival situation in an arctic environment.

Fleet Airborne Electronics Training Unit Atlantic, Detachment Brunswick

Gill nets can easily be made from parachute shroudline. These nets will work 24 hours a day and are the easiest, most dependable means of obtaining fish. Large nets can be used to capture small game and birds.

SEQUENTIAL SURVIVAL



BOTH pilot and RIO were successfully rescued from the water minutes after a recent rear seat initiated sequential ejection from an F-4. The F-4 was launched at 2030 as scheduled. As the aircraft nosed over after a normal cat shot, the RIO recognized the "in extremis" situation and initiated ejection. The pilot states that as he, himself, yelled "Eject!" and moved his left hand rapidly to the alternate ejection handle, he heard an explosion behind him, his canopy then separated and he was ejected. In all probability, had the pilot been required to initiate the ejection, he would not have survived.

As in most ejections, there are valuable survival lessons to be gleaned from the pilot's and RIO's post ejection narratives. The very fact that ejection took place so close to the ship created problems not encountered in the open sea.

Here's the pilot's description of what happened to him:

"The seat ride produced two individual sensations: a seemingly prolonged acceleration followed by disoriented tumbling. I don't recall seeing anything during these two phases. Chute deployment was a moderate but comforting shock. My helmet had rotated down almost over my eyes and my oxygen mask, which had not been adequately secured to the helmet, had come loose on the right side. After pushing my helmet back I saw the ship from an altitude slightly above flight deck level. Water entry followed very quickly – it felt almost exactly like the tower jump experienced in training.

"I quickly came to the surface and inflated my Mk-3C. Then I became greatly concerned about two things: my closeness to the ship (I was probably 30 to 50 feet from her port side) and the quantity of flares, wands and life preservers being thrown overboard.

I was positive that I would be sucked under by the ship if I didn't get rid of my chute. I reached for my koch fittings but was unable to distinguish them by feel through my wet nomex/leather gloves. I quickly discarded the gloves and looked down at the fittings, then popped them open. My chute was in front of me, between me and the ship.

"Shortly thereafter, the first of two wake-waves swamped me but caused no serious problem. I turned my back to the second one and continued drifting aft of the ship. I saw another person in the water within 50 feet and although I couldn't positively identify him because of sea spray caused by the helo, I felt it was the RIO and I was extremely relieved. I then turned my back on the helo, disconnected the left side of my mask and discarded it. After disconnecting my left rocket jet

fitting, I picked up a wand which was floating nearby and held it up to signify I was OK. I considered jettisoning my seat pan altogether but decided I might need the raft and other gear should the rescue effort turn to worms.

"I then pulled out a day/night signal flare, examined it and kept it ready in my left hand. I had the wand in my right hand and a lighted flare was floating nearby. For what I estimate was 10 minutes, I floated and watched the helo overhead the RIO. The helo started broadcasting 'Pilot, get away from your chute!' over and over. After several checks of my immediate area I realized they were addressing the RIO, not me and I was distressed by the fact that he was in some difficulty.

"A small boat approached about this time. I signaled thumbs up with my wand, dropped the signal flare and switched the wand to my left hand. When the boat came alongside I jettisoned the seat pack and was helped aboard . . . "

'In all probability, had the pilot been required to initiate the ejection, he would not have survived.'

Before we consider the RIO's survival experiences, his recollection of ejection is of interest here.

"The cat shot felt normal," he recalled, "and I observed the end speed to be passing through 150 knots. However, immediately off the end of the ship I felt a sinking sensation which I confirmed by the gyro. Out of the corner of my right eye I saw the carrier deck above us. I shifted my scan to look out of the left side. I noticed contact with the water was imminent since the nose was still down and there was no indication of rotation. I felt the possibility of recovery was too minimal so I pulled the alternate ejection handle.

"The whole sequence happened so fast I had neither the time nor the presence of mind to communicate any corrective command or warning to the pilot. I pulled the handle with my left hand, placing my right hand on my left wrist. I was sitting fully back in the seat, head slightly forward, feet full forward and flat on the firewall and the seat lowered to about three-quarters down. This is my normal position during cat shots. The ejection sequence worked as advertised and when the chute deployed I looked back in search of the pilot. I did not see him but I saw the airplane, which was still in burner and in a nose high attitude, falling off to one side. Then I looked down and saw that I was about to enter the water so I inflated my Mk-3C.

"I landed somewhere aft of the bow and forward of the angle, about 15 feet from the side of the ship and got tangled in the shroud lines. As the ship passed, I was submerged by the wake. When I surfaced, I had time for one breath and was pulled right back down by my parachute. I had no success trying to resurface so I undid my koch fittings. Although I was wearing nomex flight gloves and was underwater, I had no trouble freeing the koch fittings. I then resurfaced and looked for my shroud cutter, which I kept in my flight suit pocket, but it had been lost in the ejection. I tried to free my survival knife which was attached to my torso harness but at this time the helo arrived and dropped the horse collar about five yards away so I swam to it and hung on. I then undid my lap belt fittings and took my helmet off." *(It's a good idea to keep the helmet on for hoist. Further, although the pilot was wearing the required survival vest, the RIO was not. Air Crew Systems Change 162 of 28 March 1968 states, "All pilots and aircrewmen except those wearing T-65 body armor shall be equipped with and use the SV-2A survival vest." – Ed.)*

"During the ejection the right side of my oxygen mask had come undone although the left side had remained fastened. I considered the mask and hose a possible source of further entanglement. *(Presumably the RIO jettisoned the mask and hose. – Ed.)* Someone from the helo crew hollered something which sounded like 'Get away from the hoist!' When I let go of the hoist the helo backed off about 20 yards and lowered a crewman. He freed me from the parachute and I was then hoisted up followed by the crewman. We then were recovered aboard the carrier."

The RIO had three comments:

- "The position of my shroud cutter was good for ready access but it should have been tied down.
- "The impending danger of getting hit by the ship should not deter one from getting rid of the parachute. In the water, the parachute is the survivor's biggest enemy.
- "The greatest limitation to the command ejection sequence is when the RIO decides to eject, he has committed the pilot to the same action, leaving the pilot no option to try to fly the plane. Furthermore, in a rapidly deteriorating situation, there is little or no time for communication."

Indeed, no one can argue with the truth of the RIO's final statement. However, the tradeoff is – as in this case – the RIO's initiation of the sequential ejection system can save his and the pilot's lives.

notes from your flight surgeon

Bypass

IF a TA-4F pilot had accepted an equipment shortcut proposed on the flight line, his subsequent successful ejection might have turned out otherwise.

After preflighting and strapping in, the pilot was unable to conduct a satisfactory ICS check with the copilot when electrical power was connected. He could hear the copilot but was unable to transmit on ICS. An avionics technician who came to check the trouble said, after testing the circuit, that the connections in the pilot's seat pan were bad but that he believed he could connect the pilot's integrated oxygen/communications hose directly to the aircraft, bypassing the seat. This would only take a few minutes, he said. The pilot asked if he would have emergency bailout oxygen with this arrangment. The technician replied that he would not. The pilot then said he would wait until it was fixed properly and he unstrapped and got out of the aircraft. The trouble was rectified by changing the seat pan.

"In retrospect," the pilot writes, "had I connected my oxygen hose directly to the aircraft my neck would have taken the full force of hose disconnection when ejection was initiated. I recommend that *all* aviators be reminded again of the serious consequences possible if they accept shortcuts or jury rigs in order to get airborne. If I had connected the hose directly to the aircraft console I might not be here writing this."

The squadron has taken action to insure that such a shortcut is not proposed again.

The latest modification to the dual visor-equipped APH helmet is a cutaway of the frontal edge of the visor housing to improve upward peripheral vision. Interim Air Crew Systems Change 173, Naval Air Development Center message 091004Z of May 1969 refers. Future APH procurements will reflect this modification.

Compromises Protection

THE RIO of an F-4B which crashed sustained burns of the left forearm. He had ripped both sleeves of his nomex flight suit so he could roll them up when he wasn't flying.

Flight surgeon's recommendation: "All aircrewmen should be reminded that nomex flight suits are not to be modified in any way which could possibly compromise their primary purpose – that of protecting the wearer from burns."

Helmet Save

WHEN a UH-34D made a forced landing due to loss of power, it finally came to rest imbedded in a sand bank. The last crew member to depart the aircraft was struck on the helmet by one of the main rotor blades when it dropped down as the main rotor slowed. The blow knocked him unconscious and threw him to the ground with an impact which cut his lip and broke three teeth. Although he remained unconscious for five minutes, he suffered no aftereffects. *Without the protection of a helmet this would have been a different story.*

Know Your NATOPS

THERE'S a time for wearing your oxygen mask and a time for discarding it, so sayeth NATOPS. The overland ejection of pilot and RIO in a recent F-4J accident is a case in point.

The pilot may very well owe his life to the fact that, as prescribed by NATOPS, he removed his oxygen mask during the parachute descent before he touched down and subsequently lost consciousness.

"The ride down took about 12 minutes during which time I became concerned about the landing because I could hear the wind blowing and gusting and I was swinging and oscillating violently in the chute," he reports. "I knew I was drifting very rapidly across the desert away from the sand and towards an area strewn with boulders and brush. I went over every piece of information I could recall about landing on the ground . . . I removed both sides of my mask and tucked it down into my Mk-3C. This turned out to be the best thing I did. I can't stress enough how important it is to get the mask off.

"As I neared the ground the chute was swinging me quite a bit. As it turned out, the swinging increased my descent rate and drift

and caused me to crash into the ground. The instant I touched down I lost consciousness. I was not really aware of anything until I was being taken from an ambulance into the dispensary. Again, I stress the importance of removing the oxygen mask because the oxygen supply would have been exhausted long before help arrived."

At the time of the ejection, the RIO was flying with his oxygen mask unfastened on the right side, in violation of NATOPS. Although his helmet chin strap and nape strap were snug and his visor was down, his helmet came off during the ejection. The oxygen hose stretched initially, then broke loose. During the process he acquired a cut behind his left ear.

Know your individual model aircraft NATOPS from cover to cover and take advantage of naval aviation's collective experience. It can save your life!

Canopy Failure

RECENTLY, the canopy on a T-1A shattered while the aircraft was cruising at FL 370 (cabin pressure altitude 18,000 feet). The canopy frame and jagged pieces of plexiglass attached to the canopy frame remained on the aircraft. The pilot landed the aircraft with no further damage.

Investigators thought the most probable cause was that either the canopy had been severely scratched or had been struck a hard blow by some unknown object. In either case the canopy could have been weakened enough for it to fail under the differential pressure conditions existing at flight altitude. Some sort of ground support equipment was suspected because of yellow paint and scratch marks on the side of the lower port air intake and small skin puncture marks on the upper port air intake.

No personnel injuries occurred during this incident. This is attributed to the fact that the pilots took prompt action by descending to a lower altitude and were flying with their helmet visors down.

Oxygen Trouble

AFTER a section of A-4's on a cross country training flight leveled off at FL 290, the wingman observed that he had a zero lox indication. His control of the aircraft was becoming unstable and he later reported his vision had diminished and he was breathing heavily. The flight leader, suspecting that the wingman was becoming hypoxic, instructed him to activate his bailout oxygen bottle and prepare for descent.

Intending to pull the bailout bottle, the wingman pulled the secondary ejection handle instead and the canopy separated from the aircraft. Luckily he did not pull the handle far enough to initiate ejection. (He pulled the bailout bottle successfully on the second try.) He remembers going through 10,000 feet at 425 knots. At 4000 feet he recovered control of the aircraft, slowed to 200 knots and returned to base.

The wingman reports that the hose of his oxygen mask had separated at the connecting point to the mask and lox had most likely leaked out of the system into the cockpit, partially depleting the system in the time he spent on the ground prior to takeoff. His aircraft had not been serviced with lox at the interim stop. He remembers having six liters on shutdown but does not remember checking the quantity again prior to takeoff.

Earlier that same day the wingman had discovered separation of his oxygen hose from the mask and had taken his mask to the equipment shop to be fixed. Apparently the Tinnerman clamp had not been tightened enough to prevent the hose from separating again. On inspection of all the oxygen masks in the squadron, six more were found from which the hoses could be separated at the same place with ease.

There are two points which can be made here:

- If you are a pilot, have your aircraft serviced completely and monitor your oxygen system and gages closely.
- If you work as part of a ground crew or in a shop, maintain high standards of quality control.

The Accident That Didn't Happen

IT WAS a raw, nasty winter day and the Gulf Coast area from Galveston to Panama City was pretty much the same. Ragged ceilings existed with low scudding clouds sweeping below the overcast. Winds were averaging 20 knots with gusts to 30. Rain was falling with occasional heavy rain showers and the temperature was in the low 40's.

It wasn't a good day to aviate but then it wasn't bad enough not to, either. The four pilots about to depart Pensacola for Corpus Christi in a trusty TS-2A gathered around the aerologist so as not to miss a word of the briefing. They were pleasantly surprised when he reported that ceilings and visibilities were not down to minimums at any of the enroute stations and he even forecast VFR conditions by the time they got to Corpus. The easy banter which had existed among the pilots prior to the weather brief was resumed as they departed aerology for the clearance desk. One of the pilots who would not be in the cockpit requested that the plane commander fly smoothly on this leg so as not to disturb the sleepers "in the back." The only unusual occurrence prior to their departure was that *all four pilots* made complete and independent preflights of the plane before they climbed in. After the plane taxied out the linecrew returned to the line shack and one of them said, "Those guys didn't miss a thing."

An hour later while cruising at 8000 feet and logging the kind of time you can't buy, a strong odor of fuel was detected. The plane commander told the copilot to set channel 77 (emergency) on the IFF and he picked up the mike:

"Houston Center, this is Navy six, four, zero, zero, emergency, over."

"Navy six, four, zero, zero, Houston Center, go ahead."

"Six, four, zero, zero, 15 west of Gulfport vortac at 8000, we have very strong fuel fumes in the plane. Request clearance direct Navy New Orleans."

"Roger, Navy six, four, zero, zero, turn right heading two two five degrees for vector direct Navy New Orleans. You are 43 miles from the airport. When you have time squawk one one zero zero."

"Roger, Turning to two two five, squawking one one zero zero. Six, four, zero, zero would like to start descent."

"Roger, Navy six four zero zero, descend and maintain 5000 feet, expect lower altitude after passing Victor 240 and expect tacan approach runway 4.

"Roger, leaving 8000 for 5000, this is six four zero zero."

"Navy six four zero zero, this is Houston, contact New Orleans Approach Control on 118.1 or 284.7. Good luck."

"Wilco, contacting Approach on 284.7. Thanks for the help!"

"New Orleans Approach Control, this is Navy six four zero zero on 284.7. We're out of 6000 descending to 5000 on the zero four eight radial of Harvey vortac at 32 miles."

"Roger, Navy six four zero zero, we have alerted Navy New Orleans. Present Navy New Orleans weather – partial obscuration, 800 overcast, 2 miles in rain, wind zero one zero degrees at 10, altimeter 29.92. Duty runway 4."

"Roger the weather. Six four zero zero now maintaining 5000."

"Navy six four zero zero, New Orleans Approach. You're at the 25 mile DME fix on Harvey zero five zero radial. Cleared for tacan approach runway 4, contact Navy New Orleans Tower on 340.2 at seven miles on final."

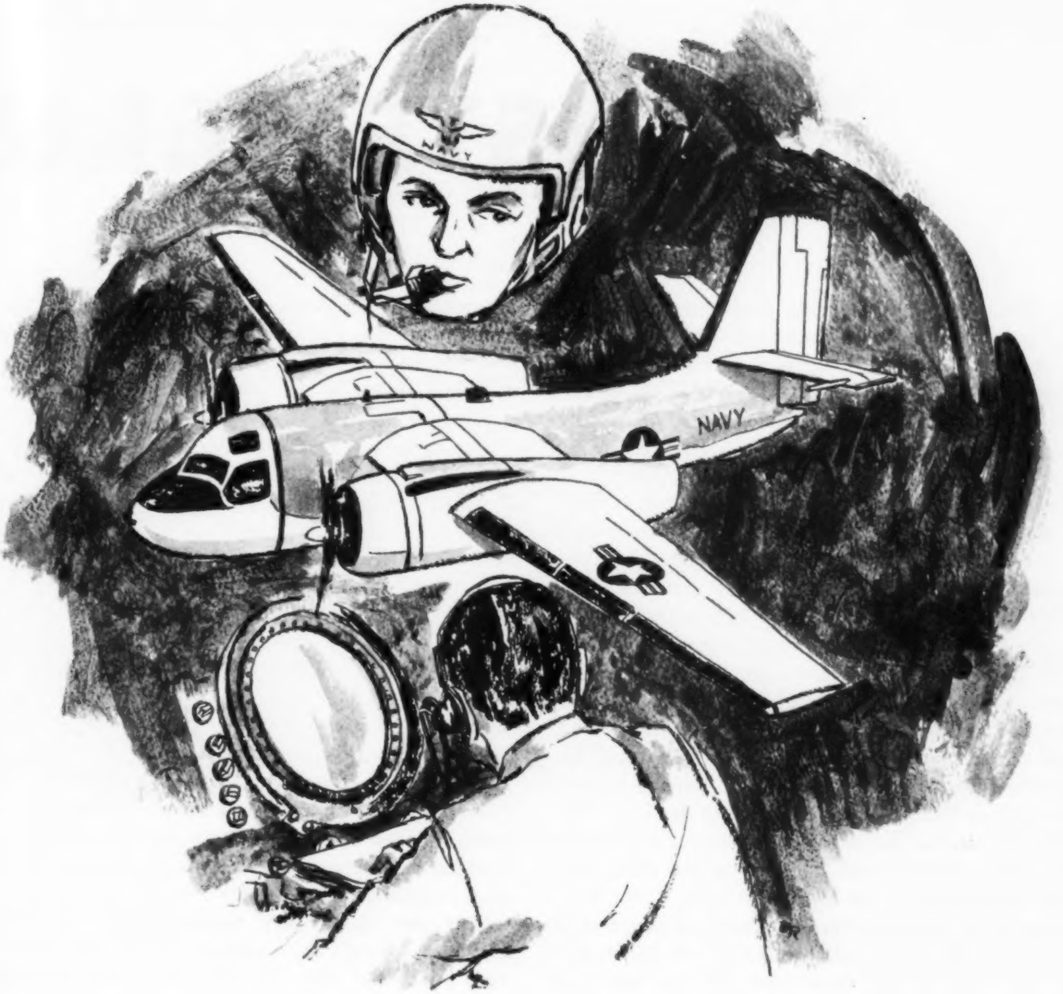
"Roger, on position. Six four zero zero leaving 5000."

"Roger, out of five."

"Approach, this is Navy six four zero zero. We're out of 4000 and would like a straight-in GCA to runway 22."

"Roger six four zero zero, maintain 2000. Your position 15 miles northeast of the airport contact Navy New Orleans GCA on 345.2."

"Six four zero zero to maintain 2000, switching to 345.2. Thanks."



To conclude the flight phase the GCA approach and landing were routine. The plane commander was a real pro. He had encountered problems along the route. He promptly recognized the seriousness of the problem, declared an emergency, stated what he wanted to do and received the finest kind of help from Houston Center, New Orleans Approach Control and the GCA unit – and he stayed ahead of his plane all the way.

The fuel fumes were so strong that all four occupants became highly irritated and nauseated. The strong fuel fumes became even worse. When they dropped the gear on final the vision of both pilots was impaired. Despite this they made a smooth landing, secured the engines after rollout and abandoned the plane on the runway.

The station fire chief estimated 50 to 60 gallons of fuel were in the bilges of the crew compartment. A hole was found in the bottom of the port wing inboard forward fuel cell which allowed fuel to leak into the wing cavity. The wing cavity drains were clogged preventing the fuel from escaping and forcing the fuel under ram-air pressure into the bilges. Exposed continuous operation inverters did not, but could have, ignited the fuel.

Thanks to a truly professional approach to flying, this was indeed a happy landing for four Naval Aviators. It pays to know where you are and what you want to do in an emergency.

Plan ahead. ◄

HASTE makes

AFTER being catapulted the A-4F pilot raised the gear handle. The main gear indicated UP but the nose gear indicated UNSAFE. The pilot maintained speeds below 220 knots and proceeded to rendezvous with his section leader for a visual gear check. Due to a launching delay, it took a few minutes for the section leader to effect a rendezvous. During this interval the A-4F pilot lowered his gear handle; received an indication of DOWN for the main gear but still had an UNSAFE indication for the nose gear. His section leader completed the rendezvous and advised him that all gear appeared to be DOWN and LOCKED, i.e., he could see through the nose gear pin holes which indicated the nose gear was locked.

The A-4F pilot concluded that he had normally operating gear but had a faulty nose gear microswitch (based on cockpit indications, previous gripes and the visual check). He, therefore, raised the gear handle to retract the gear, whereupon the section leader noted the main gear to be up and the nose gear to be down. The A-4F pilot left his gear in this configuration to conserve fuel, orbited the ship overhead with the A-4 tanker and awaited recovery.

Just before his assigned recovery time the pilot placed the gear handle down and again noted indications that the main landing gear were down but that the nose landing gear was unsafe. The A-4 tanker pilot gave him a visual check and reported that "all gear appear to be DOWN and LOCKED." The A-4F pilot flew by the platform for an LSO visual check with the same result; all landing gear appeared to be down and locked. He then commenced a landing approach.

The recovery was normal until the arrestment rollout, during which the nose strut was observed to veer laterally in both directions and finally to fail, collapsing after 184 feet of aircraft travel. The aircraft then slid 35 feet on the nose and droptanks. The uninjured pilot secured the engine and, with the aid of the crash crew, expeditiously exited the aircraft. The aircraft sustained substantial damage.

During the investigation of this accident it was determined that prior to the launch the airframes branch line troubleshooter had noticed that the A-4F nose strut needed servicing. He had passed this on to the work center supervisor who assigned an AMH2 and an AMS3 to the job, directing that the aircraft be jacked for the required servicing.

The AMH2 and his assistant jacked up the nose of the aircraft and had the nose gear strut fully extended when it was serviced with fluid. This is contrary to approved procedures in that the maintenance requirement card does not specify jacking the aircraft. Servicing the strut with the extended oleo permitted an overservice of 3.3 quarts of fluid. Thereafter, the AMH2 serviced the strut with nitrogen as required by the maintenance requirement card.

The investigation revealed that the work center supervisor had confused the *normal calendar inspection* for nose strut servicing with the procedure for *conditional* servicing. During calendar inspections the aircraft is jacked up but before the strut is serviced, it is compressed by a scissors jack. On the other hand, for conditional servicing, the strut is compressed by the weight of the aircraft.

The work center supervisor's incorrect instructions – and the AMH2's failure to question them – set the stage for the subsequent accident. However, the accident was not – or should not have been – the inevitable result of this incorrect maintenance action.

Aircraft maintenance is performed by people and people do err. Because of this fact, our system of naval aviation maintenance incorporates many checks designed to minimize the possibility that a maintenance error will remain undiscovered and ultimately result in an aircraft accident. So, what happened in this case? Why did this maintenance error go undiscovered until *after* the accident.

System Short-Circuited by Shortcut

Ordinarily, the AMH2 would notify the work center supervisor upon completion of strut servicing and the work center supervisor would ordinarily have the work checked by quality assurance personnel prior to placing

WASTE

The A-4F pilot flew by the platform for an LSO visual check.

the aircraft in an UP status. Had this procedure been followed, the over-serviced strut *probably* would have been detected and an accident might thereby have been prevented.

Unfortunately, the AMH2 chose to shortcut normal procedures and reported the aircraft to be in an UP status *directly* to hangar deck control rather than to his work center supervisor as he should have done. Why? First of all, it was an error of judgment but there was an element of justification for his action. The C.O., in his endorsement stated in part: "Considerable pressure was placed upon the AMH2 to get the aircraft up for the next launch cycle. He did save time by reporting the aircraft UP (direct) to hangar deck control; however, in so doing, he prevented squadron quality assurance from detecting the improper strut servicing. The relative importance of safety versus haste has been brought to the attention of all maintenance personnel.

> Why is it that, when there isn't time to do the job safely, there is always enough time to take care of the injured, pick up the pieces, patch up the airplane, fix the damaged equipment, investigate what happened, write up the reports and try to explain to the boss why time wasn't saved.
>
> *NAS Willow Grove Aviation Safety Council Notes*

Intangible Effects

This accident was caused in part by a lack of judgment and a lack of knowledge but it seems reasonable to believe that it was also caused partly by the high tempo of operations. We believe that the circumstances concerning this accident can provide all levels of naval aviation with a degree of insight into the effects of increased tempo of operations and be an aid in future accident prevention efforts.

When you feel the urge to press on regardless . . . .
That's the time to

Stop and Think It Over!

THE T-1A pilot requested and received approval for a cross-country navigational training flight to RON at an Air Force Base about 500 miles away. He arrived in the squadron area at about 1500 local time and prepared for the flight. After checking destination weather he elected to file for another Air Force Base enroute (about 175 miles short of destination) to refuel since the weather at the destination airport was reported to be marginal and a nonstop flight would leave him with insufficient fuel to proceed to a suitable alternate should he be required to do so.

Up to this point there was no reason for anyone to doubt that the planned flight would turn out to be anything but a routine instrument navigational training hop. The pilot was an experienced naval aviator with more than 3000 hours total flight time and the holder of a special instrument card which had been renewed four months earlier following an instrument check flight which, according to the check pilot, was "an exceptionally fine instrument hop." Moreover, the pilot had flown a satisfactory NATOPS standardization flight in the T-1A some three months earlier, receiving a grade of "Qual." The pilot had flown about 100 hours during the previous 12 months which had included 28 hours in the T-1A – not an overly impressive amount of recent flight time but, altogether, the pilot was *apparently* well qualified for the flight which he was about to undertake.

However; later events show clearly that the pilot was possessed with an inordinate desire to complete his mission as planned, regardless of the circumstances which presented themselves – a fact which apparently led to his subsequent fatal crash one and one-half miles short of the destination airport.

Before takeoff from home field, the maintenance man in charge of the line called the pilot's attention to a yellow sheet gripe which noted that the elevator trim had malfunctioned during the early part of the previous flight (went to the full nose-up position). The gripe had

erroneously been written up as "pilot info" instead of as a downing gripe and no action had yet been taken to check out or correct the discrepancy. The maintenance man advised the pilot that he would have an electrician stand by when the aircraft was started in order to check out the discrepancy. The pilot dismissed this suggestion with the statement that it was *not necessary; that he was not concerned about the discrepancy.* He then proceeded to man the aircraft.

As it turned out, the elevator trim malfunction apparently did not recur during the flight and *it was in no way implicated in the subsequent crash of the aircraft,* but the pilot's handling of this incident seems indicative of an attitude which allowed him to ignore or rationalize a number of impediments to the progress of his flight.

The T-1A pilot took off from home base at about 1650 local time. It was winter time and darkness was approaching. This leg of the flight was completed without incident and touchdown was at 1815 local time at Fuel Stop AFB. While taxiing in, the pilot requested a "short turnaround." After securing the aircraft, he proceeded to the operations building to file a flight plan for the next leg of the flight.

The aerologist on duty at Fuel Stop AFB advised the pilot that current weather at destination was 300 feet overcast with one mile visibility in light drizzle and fog. The pilot then remarked that he was "told it would be better than that," and requested the destination forecast. The aerologist advised him that the forecast was for no change in prevailing conditions – except that intermittent conditions of 100 feet obscured and one-fourth mile visibility in rain and fog were predicted. At this point the pilot remarked that there was some equipment out of service at his destination and that he was going to telephone (someone at) the destination, which he proceeded to do. The aerologist, who heard part of this conversation, remembers that the pilot asked if planes were "flying in and out;" that he appeared pleased with the answer and then concluded the telephone conversation with, "OK, I'll be seeing you in about an hour." He does not remember hearing the pilot ask about equipment outage during the conversation.

Shortly thereafter, the pilot presented a DD-175 to the aerologist and asked for the regular weather briefing. The aerologist completed a DD-175-1 and orally briefed the pilot on destination weather, again noting that the prevailing weather was 300 feet overcast with one mile visibility in rain and light fog and forecast to be the same but intermittently going to 100 feet obscured with one-fourth mile visibility in rain and light fog. The aerologist stressed that the weather throughout the area surrounding destination was poor and that most stations in the area had weather as bad as that at destination, or worse. He expressed the belief that Fuel Stop AFB had the best weather, present and forecast, of any base in the area and that it appeared to be the most suitable alternate. The pilot then listed Fuel Stop AFB as his alternate, filed his flight plan and manned his aircraft.

After receiving his clearance, the pilot started the aircraft and taxied for takeoff. Enroute to the duty runway the tower called and told the pilot that the Center wanted to know if he had received the latest destination weather. The pilot replied that, "I have called Destination AFB on the Autovon and they say it is all right at the present time and they'll try to get me in. If I cannot .... my intentions are to return here." The pilot then took off, becoming airborne at 1913 local – a short 58 minutes after landing.

The flight proceeded normally and the T-1A was turned over to Destination Approach Control at 1956 local. The pilot requested the weather and was advised

that the destination weather was a partial obscuration, measured ceiling 200 feet overcast and visibility one and three-eighths miles with very light fog and drizzle; wind 210 degrees at eight knots. Approach control then advised the pilot that the runway in use at the time was 22 and that the weather was below minimums for any type approach to runway 22 (the PAR was out of service and a notam had been issued – this fact *was known* by the pilot prior to takeoff from Fuel Stop AFB). Approach control then advised the pilot that he could make an ILS approach to RW 04 but that in doing so he would have an eight knot tailwind. The pilot responded by saying, "Be advised I have negative ILS . . it'll have to be an ASR to RW 04." Approach control then advised the pilot that the field was below ASR minimums and requested the pilot's intentions. The pilot replied that ". . . My ILS is operating but it's questionable and I wouldn't want to make an approach directly on it . . . Let's shoot the ASR to ASR minimums and (if) I don't have it, we'll wave it off."

Approach control then gave the pilot a heading for a vector to an ASR to runway 04. The next three or four minutes were spent vectoring the aircraft toward final approach. During this time the controller gave the pilot the standard information on runway dimensions, condition, lost comm, etc. and finally, a special weather observation which had been made at 1958 local which described the weather as partial obscuration, 100 feet variable overcast, visibility one mile in very light drizzle – and again requested the pilot's intentions.

The pilot replied that he would make one approach anyway. He was then turned over to the final controller. During the final approach the pilot was left of centerline and apparently did not descend to minimum descent altitude when cleared, possibly due to having missed the transmission. The final controller reported the aircraft was too far left of centerline for a safe approach and the pilot requested another approach. The controller then vectored the aircraft for another approach. The pilot remarked that he would have to get in on this (the second) pass or he would have to return to Fuel Stop AFB (his alternate).

The second approach was very close in with the controller calling for the pilot to begin descent at four miles. The approach continued with the aircraft drifting from right to left of centerline and with the final controller again reporting "too far left for safe radar approach" when the aircraft was about one and one-half miles from the end of the runway. The pilot was then asked if he had the runway in sight to which he replied in the negative. The controller issued the pilot missed approach instructions, including the heading and altitude to maintain. The pilot acknowledged this information and indicated that he was executing the missed approach. This was the last transmission received from the pilot. When efforts of the controller to establish further contact with the pilot proved fruitless, the crash alarm was activated.

The investigation which followed revealed that the aircraft had struck an electric power pole with the starboard wing (at about the time of the pilot's last radio transmission), tearing away a one and one-half foot section of the leading edge slat. It was apparent that a waveoff had been commenced by the pilot; landing gear and flaps had been retracted but the speed brake had not. After the collision with the pole, the aircraft had continued on a flight path of 050 degrees for about one mile and had then struck a dense tract of trees in a wings level attitude, while still about 50 feet above the ground. The aircraft continued through the trees, rolling left and crashing into the ground. The pilot was fatally injured.

As already stated, this pilot had many years of experience and a substantial number of flight hours behind him but had accumulated only a limited amount of flight time during the previous year. This suggests that the pilot was lulled into a complacent attitude because of his overall experience. On closer examination of all aspects of the accident it is apparent that it cannot be attributed to simple complacency. Nor can it be attributed to a lack of proficiency, per se. Rather, it appears that this accident occurred because of a series of bad judgments resulting from a determination to press on, regardless. Whatever was the exact motivation for this pilot to press on is not known; however, it was sufficient to cause him to disregard an aircraft trim control gripe; make a hurried turnaround at his fuel stop; file a flight plan which contained several errors or omissions; disregard the expressed concern of several agencies about the steadily deteriorating destination weather conditions; commence an approach at destination with weather below minimums; and, finally, it appears that he knowingly descended below the miminum descent altitude in an effort to acquire visual contact with the runway.

The role of supervision in providing the proper framework for safe flight operations is recognized and should not be discounted but naval aviators (and particularly the more experienced types) are by the nature of their profession often in a position where they must act independently and make correct judgments. Each pilot must continuously strive for objective assessment of his own personal limitations and be alert to recognize motivations, personal or otherwise, which might cause him to press on, regardless. When this urge to press on is first recognized, it's time to stop and think it over – objectively. ◄

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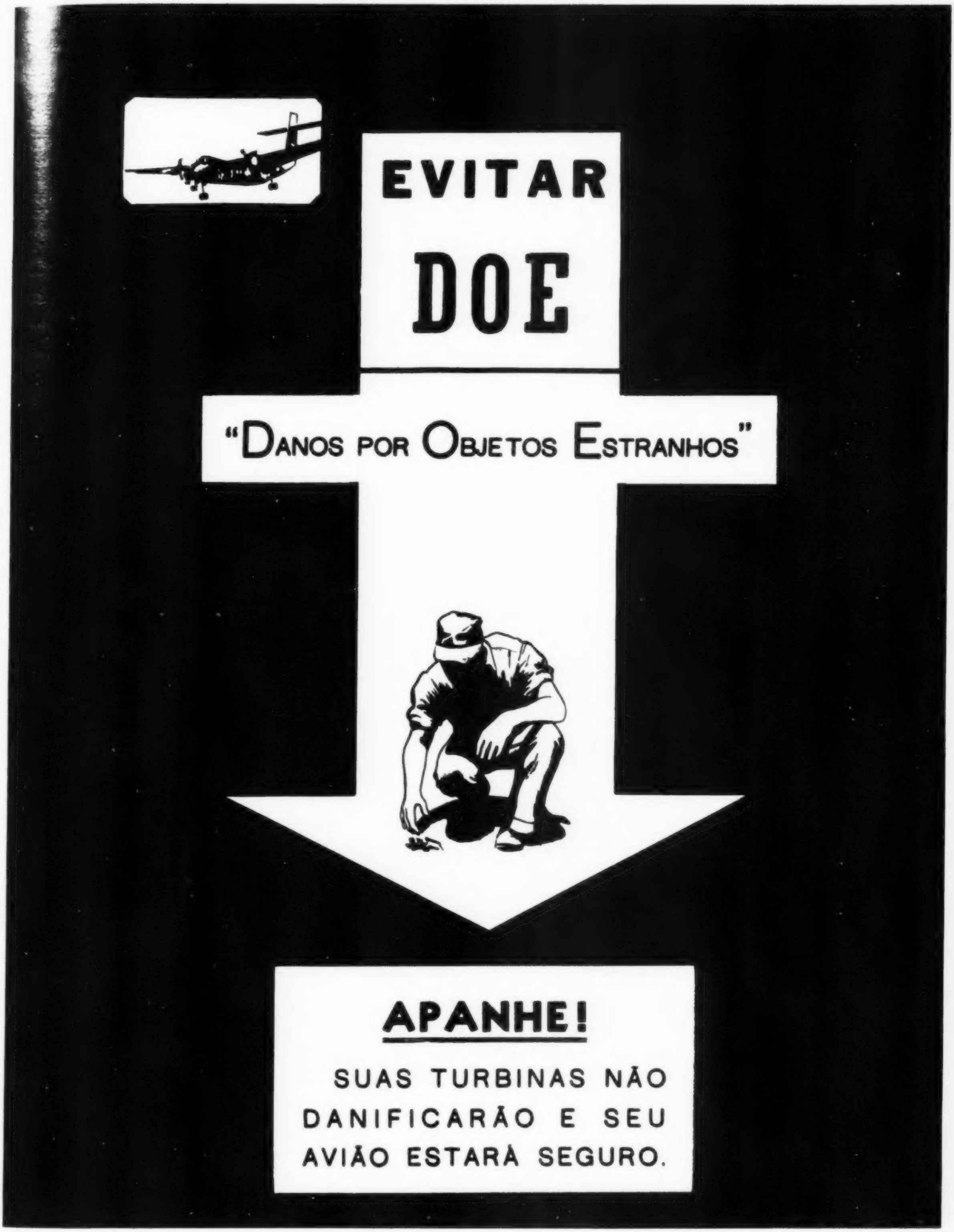
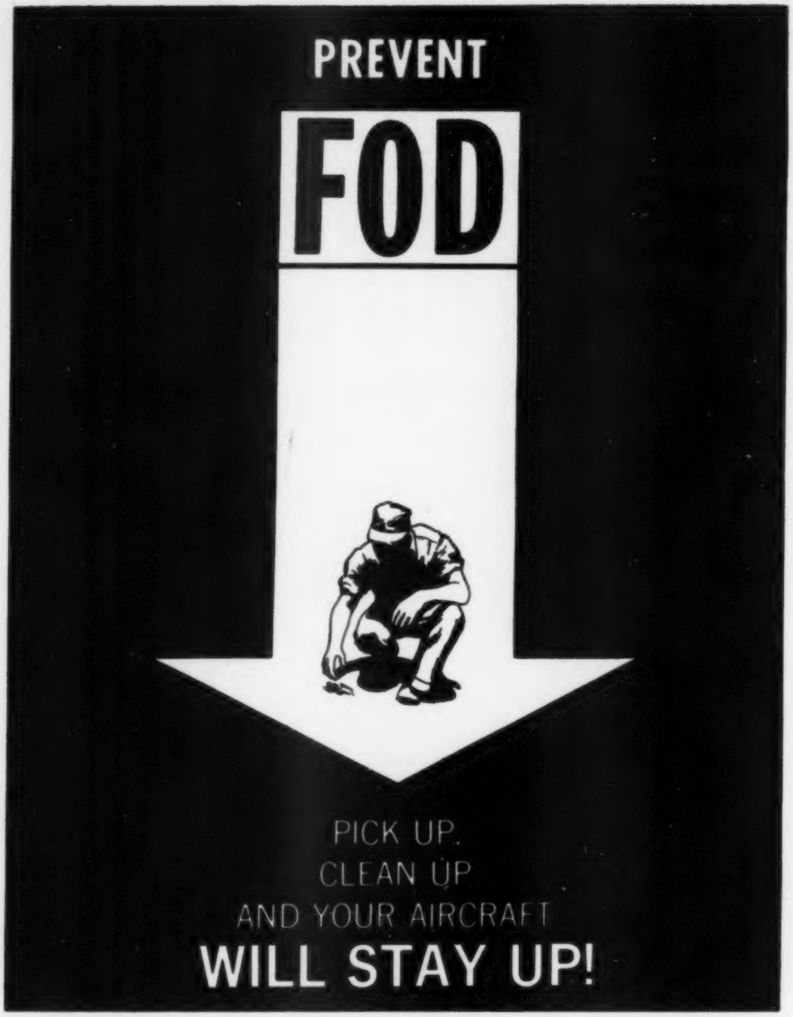


DO LIKEWISE. If you don't get the message, see next page.



DOE Means FOD

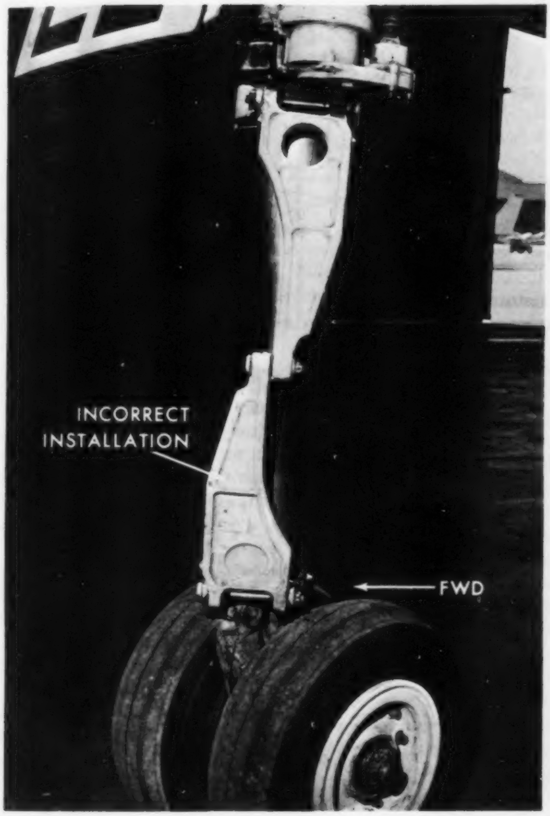
WHEN the first T64-powered aircraft arrived at Afonsos Air Base in Brazil last year, there was no FOD (DOE) Prevention program in effect. A survey of the airmen at the base revealed that they had never heard of this major cause of unscheduled removals of jet engines.

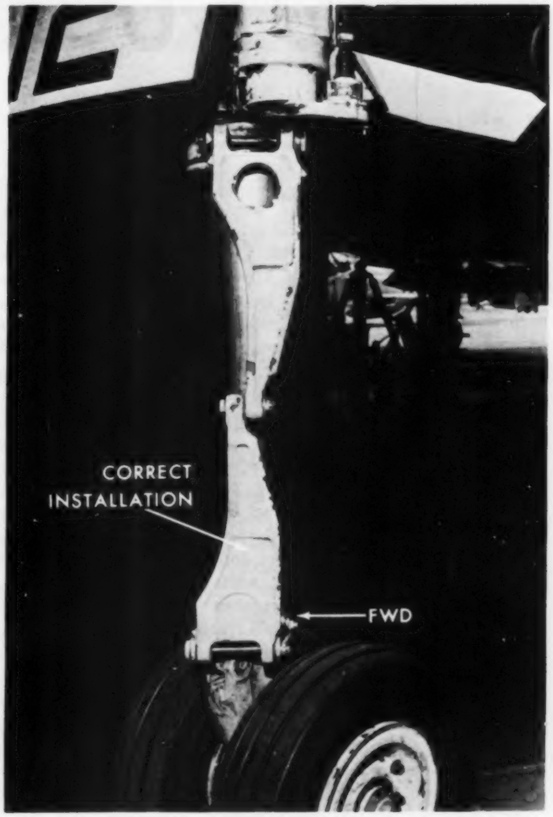
Col. Lima Telles, C.O. of Afonsos and Lt. Col. Almeida, C.O. of the new aircraft group, immediately instituted a FOD prevention (Evitar DOE) campaign. To help get the message across, they had the U. S. Naval Safety Center's FOD poster (shown above) translated and posted around the base (see the preceding page). As a result of this program, "Danos por Objetos Estranhos" has not become a problem at Afonsos Air Base.

No matter how you say it, FOD can be controlled, reduced and even eliminated. All that is required is the proper attitude on the part of every individual associated in any manner with aircraft.

MURPHY'S LAW *

F-4B Nose Landing Gear Lower Torque Arm Murphy





DURING a calendar inspection of an F-4B aircraft the nose landing gear strut was disassembled for incorporation of F-4 AFC 429 (replacement of nose landing gear retainer nut). During disassembly the upper and lower torque arms, PNs 34-45252-5 and 34-45252-3, respectively, were removed. Upon reinstallation of the lower half of the nose strut the lower torque arm was inadvertently reversed (see photo 1 and 2). Subsequent retraction of the nose gear during drop check resulted in minor damage to a cover assembly, PN 32-31800-0170 located in the port side of the nosewheel well just aft of the nose gear uplatch mechanism.

Before installation of any part, consult the Maintenance Instruction Manual even if you think you "remember"!

* If an aircraft part can be installed incorrectly, someone will install it that way!

You can't build a reputation on what you are *going* to do.

Henry Ford

Letters

Shipboard Markings

FPO, Seattle – I'd like to comment on the article on page 44 of the July 1969 APPROACH, "Let There Be Light." That white hangar deck is going to look mighty scruffy before long but will still improve the effect of the available lighting. The point is, of course, that esthetic considerations should not stand in the way of an idea or at least the trial of one.

As a vertical replenishment helicopter pilot for the past year, using the UH-46A, I have recommended that the helicopter flight decks be painted white with black markings, rather than dark gray nonskid material with white markings as is now the case. Even when the white becomes dirty from use it still would greatly increase the effectiveness of the red floodlights atop the hangar on USS MARS (AFS-1). I think it would make a night helo landing easier and safer on any non-aviation ship. At present, from my experience with the UH-2 and UH-46, it is at best hairy.

For a normal vertrep, day or night, the deck is prestaged with palletized cargo almost completely surrounding the helo before the ships rendezvous, because the cargo elevators and personnel can't get cargo to the flight deck as fast as the helos can carry it away. This means you take off vertically but still occasionally snag a wheel in a cargo net. As you hover for about 30 seconds checking the gages the thought of trying to make an emergency landing back into the UH-46-shaped hole is discouraging. If the deck were white it would be easier to see where the cargo was, and on the receiving ship it would be easier to make a safe drop since personnel and cargo pallets would be sharply outlined. (We recommend continuous use of the helo's red floodlights as well.)

In addition to the white flight deck, USN ships that could require a night MedEvac helo, even though they would not normally be night vertrepped, should have all whip antennas and similar obstructions within 50 feet of the pickup point or flight platform painted in alternating black and white bands if they cannot be folded down. This includes almost every ship. I suppose there will be objections to this also but they are certainly a hazard and I'm quite safe in saying that the Navy has spent several hundred thousand dollars on replacing rotor blades damaged by those inconspicuous gray poles!

Incidentally, about 90 percent of each vertrep is in the "Dead Man's Curve," providing a good argument for more power for the UH-46A. Now, an engine failure means the helo is lost even if the external load (about 3000 pounds for the UH-46A in SEAsia) is immediately jettisoned. There are more powerful versions of the T58 engine than the -8 series used in the UH-46A and if we had them we would have a much better chance to be able to cope with the failure of one engine.

It seems to me the whole point of buying multiengine helos is the fact that the very expensive bird can always make it home on one, just like an S-2. Right? Wrong – at least in the SEAsia area. We would have saved money by buying the H-46 with just one big engine. What needs to be done is to "insure" our investment by giving real single-engine performance, with vastly upgraded engines, at max gross and ops up to about 8000 feet density altitude.

The only alternative right now is to upgrade the reliability of the T58-8 engines now installed. Sudden, massive failure is all too common. The rework may be better than it looks to the pilots out here but I doubt you could get one of these RFI engines installed in a Presidential VH-3. So there are varying degrees of RFI-ness.

Aside from the white flight deck, more visible shipboard markings of hazards and more horsepower, I would like to add that the July issue was exceptionally well done. In fact, I'm borrowing it tonight so my wife can enjoy the "letter" beginning on page 23.

LCDR D. E. Barck
HC-7, FPO, Seattle

• It's pretty obvious that you have been giving considerable thought to improve safety in many areas. Many of your ideas and suggestions have considerable merit and are being passed to NavAirSysCom for action with our favorable endorsement. If more people like you took the time to write, you operators would see many other changes, near and dear to your heart, put into effect.

We agree with you on most of the

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

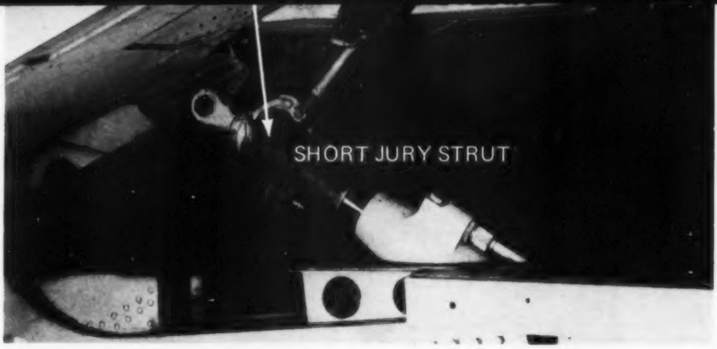
points which you raised. In particular it does seem strange that at every airport in the world except our floating airports, obstructions and hazards which extend above the surface are carefully painted in alternating bands of red and white, and are well lighted at night.

However, being realistic without being discouraging, we must point out that any aircraft put into military usage is usually characterized by design tradeoffs. For example, each power plant selected for our birds is a careful compromise between cost, weight, size, power output and growth potential. Our records do not support your implications that there have been a large number of dual, massive engine failures in the CH-46A. In those cases where single-engine failure was experienced, the bird has been generally saved. With respect to increasing engine performance, as you know, the CH-46D/F do have upgraded engines and improved single-engine capability.

Sequel to "Gotcha" Article

Dallas, Texas – I would like to add a few comments regarding the "hand caught in the speedbrake" F-8 incident cited in the *"Gotcha"* article in the July 69 APPROACH.

The method of turning electrical power off to crack the speedbrake is applicable only to the F-8A/B/C/L and K aircraft (rocket pack deactivated by AFC 333). It will not work on F-8D/H/E/J and RF-8A/G aircraft because the rocket pack portion of the speedbrake actuator has been removed. Since the speedbrake does not droop in these aircraft when electrical power is off, there is less possibility that someone will get caught. However, since there is



avionic equipment now installed in the speedbrake bay of the F-8H/J, the frequency of having to work in this area will increase. Because there is a possibility of someone/something getting caught, it would be worthwhile to pass on the word as to what to do to prevent further such accidents with these types of aircraft.

With weight on the landing gear there is *no* electrical control of speedbrake position regardless of override switch position, electrical power on or off, wing up or down or speedbrake switch operation; with utility hydraulic pressure, the speedbrake will be fully retracted. The quickest way to extend the speedbrake is to depress and *hold both* solenoid override buttons on the selector valve. This valve is located in the left main landing gear wheelwell about 18 inches above the pressure fueling manifold. (If the upper button is released, the speedbrake will remain in the existing position; if the lower button is released, the speedbrake will again close.)

John Roschlau
Safety
Vought Aeronautics Division
LTV Aerospace Corporation

• Thank you for the information amplifying the original article. Its importance is emphasized by the following letter:

FPO, San Francisco – With the installation of units of the APR-30 and the APQ-124 in the speedbrake wells of F-8J aircraft, a new and serious potential for injury to avionics personnel has arisen.

This potential was made painfully clear recently when one of our technicians nearly suffered serious injury while working in the speedbrake area. Hydraulic pressure was inadvertently applied and his arm was caught in the speedbrake. Fortunately, the hydraulic jenny operator heard the man yell and stopped the rising pressure at 400 psi. The man suffered bruised muscles, pinched nerves and complete numbness in his hand for a few days. The full 3000 psi could have easily removed his arm.

Our maintenance department has devised a safing device from locally-procured materials (see photo). With these shorter jury struts it is possible to safety the speedbrake while the aircraft is sitting on its landing gear. It is still not squadron policy to work in this area while hydraulic pressure is being applied to the aircraft; rather, this device is a precautionary measure to prevent injuries.

ATC R. E. Kuhn
VF-51

• This appears to be a positive way to safety the speedbrake during extended work in the speedbrake opening area. Copies of this letter and the photograph have been forwarded to NavAirSysCom for information. As of now, the best way to ensure against injury from the electrical, pneumatic and hydraulic powered devices referred to in the original *"Gotcha"* article is for personnel to exercise the utmost caution when working on and around them. Any time inexperienced personnel are involved in such work, supervisors should insure that there is a knowledgeable and responsible person on the scene to direct operations.

Vol. 15 **approach** No. 5

RADM Roger W. Mehle

Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

Contents

Departments

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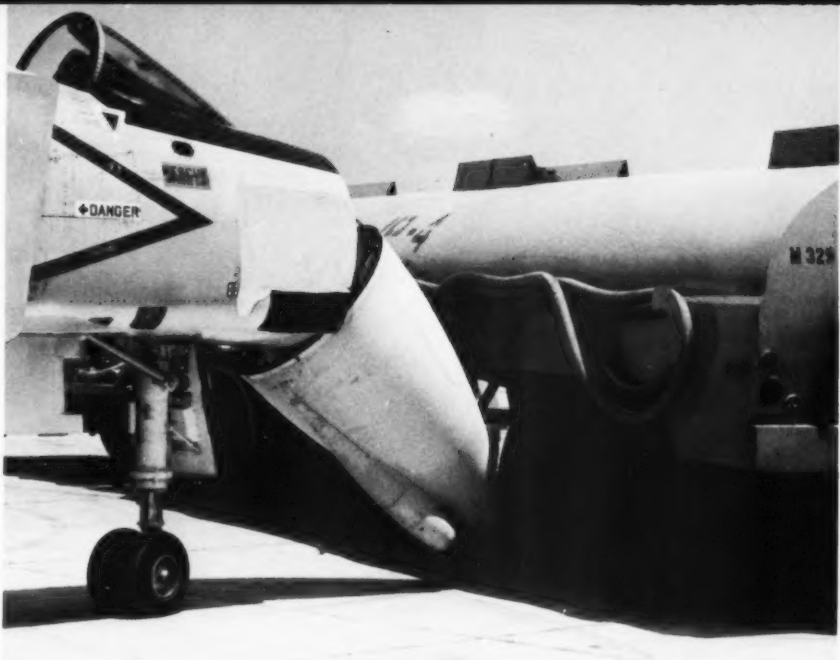
Next Month

Back in the Saddle

Credits

Cover painting by Craig Kavafes shows the F-14A returning to the carrier empty of all stores after completing a mission. Courtesy of Grumman Aircraft Engineering Corp., Bethpage, L. I. **Pg 7** Photo courtesy the Department of Civil Aviation, Commonwealth of Australia **Pg 35** B.C. by Johnny Hart. Courtesy Johnny Hart and Field Enterprises Corp. **Pg 44** Text courtesy GE Jet Service News.



SEMANTICS

ACCIDENTS are often attributed to *carelessness*. The man who wraps up his shiny new sports car is said to have been *careless*. Likewise, the technician who burns his hand on a hot soldering iron and the mechanic who contributes to an accident by his failure to install a cotter pin in a critical installation are frequently characterized as being *careless*. In all these cases the word *careless* (or *carelessness*) could be replaced with a word which would be more definite as to the true causes of the accident/incident.

Let's parse the word *carelessness*: *care* = watchful attention, *less* = devoid of, and *ness* = state of being. Therefore, *carelessness* may be defined as "a state of being devoid of watchful attention." But even this explicit definition explains little with regard to the causative circumstances surrounding an accident. What has really been said with the word *carelessness* is that the man wasn't paying attention to the task at hand.

The word *thoughtlessness* is suggested as a better definition of accident causation. This word is defined as "a state of being devoid of the act or process of using the mind actively and deliberately (thought)." This brings the mind processes into the picture and more definitely pinpoints the cause of an accident, i.e., the failure to apply active and deliberate thought to the task at hand.

The word *carelessness* is like a blanket cast over the facts and explains nothing while *thoughtlessness* places the act or omission in the mind, a point from which active leadership and supervision may learn the facts and proceed to take appropriate corrective action.

Adapted from material contributed by
Mr. John Sorrow, NAESU Staff Engineer


NAVY